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# USSR Report

CONSTRUCTION AND RELATED INDUSTRIES

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13 November 1985

# USSR REPORT

## CONSTRUCTION AND RELATED INDUSTRIES

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## CONSTRUCTION PLANNING AND ECONOMICS

### MEASURES TAKEN TO STIMULATE CONSTRUCTION LABOR

Moscow TRUD in Russian 5 Mar 85 pp 1-2

[Article: "Improving Organization and the Wage System, and Stimulating Construction Labor"]

[Text] On 24 January 1985, the USSR Council of Ministers and the All-Union Central Council of Trade Unions Adopted the Decree "Improving Organization and the Wage System, and Stimulating Construction Labor".

The USSR's ministries and departments and union republican councils of ministers have been charged, for 1985 and during the 12th Five-Year Plan period, with taking measures aimed at further strengthening the economic motivation of the labor collectives of construction and installation organizations by promptly putting production capacities and projects into operation, by speeding up growth rates for labor productivity, by improving construction quality and by reducing the production costs for these operations. In this connection, they are to insure a closer relation between the wage fund to the volumes, nature and labor intensiveness of the completed work.

In 1985, USSR Gosplan was charged with giving approval for the 12th Five-Year Plan period to USSR Ministries and departments and union republic councils of ministers for differentiated stable wage norms, depending on the type of work done, for those workers involved in construction and installation work, and for those working in subsidiary industries, the above agencies having foreseen in them progressive relations between labor productivity growth rates and the average workers' wage increases.

USSR ministries and departments and union republic councils of ministers, main construction administrations, associations, trusts, administrations and other construction and installation organizations together with central committees, republican, kray and oblast councils and trade union committees are obliged:

to develop and implement measures for further widespread dissemination of progressive forms of organization and stimulation of labor within the construction industry, which measures will insure the successful execution of construction and installation operations, primarily using the brigade and integral-process flow-line contract methods;

to introduce a system of annual, quarterly and monthly operational planning into the construction industry for the production sections and brigades, and to make provision in the schedules for goal-oriented tasks related to the execution of individual production stages of construction and installation work, and related to putting production capacities and facilities into operation;

to change the brigades over to a cost accounting system, having made an accounting of the expenditure of material and other resources within the brigades;

to consolidate the brigades for the purpose of making it generally possible to carry out the final production stages of a construction project, or to construct entire projects, using the workers of a single brigade. As regards the accumulation of experience, to change production section collectives over to contract forms of organization and wages, and to do the same further down the road with the larger structural subdivisions. To make, where it is advisable, engineering and technical personnel part of the consolidated brigades, and to entrust them with providing guidance to the brigades and paying them according to the work completed by each brigade;

to enlarge the role of brigade and brigade leaders' councils in supervising production, improving the organization of labor and strengthening discipline. A recommendation has been made to set up brigade leaders' councils made up of representatives from the general contracting and subcontracting organizations, this to be done right on the construction project site;

to retrain (raise the skill levels of) brigade leaders in 1985-1986, and thereafter to carry this out no less than once every five years.

Additional payments have been set up for brigade and link supervisors for their tasks of supervising their brigades and links. These payments depend the number of their workers, and the volumes and specific nature of the work done. The payments are made where assignments are carried out by the brigade or link within the specified time limit, where the work done is of high quality, and with consideration for the state of labor and production discipline.

For the purposes stimulating the multishift work of the construction and installation organizations and bringing about improvements in the utilization of construction equipment, supervisors of construction and installation trusts and supervisors of other organizations of the same level have been given the right to prescribe, as per agreement with corresponding trade union committees, additional wage payments for workers and line engineering and technical personnel in the amount of 35 percent of the hourly wage rate (salary) for each hour of night work, within the limits of the wage fund of the indicated organizations and the estimated construction costs of the corresponding projects.

It has been suggested that the USSR ministries and departments and union republic councils of ministers, main construction administrations, trusts, administrations and other construction and installation organizations undertake a gradual changeover to accounting of wages based on finished work, using

construction estimates, and that they insure the use of consolidated combined norms and estimates, and use this basis to set up a lump wage payment system based on final results (stage, junction, structure, project).

When developing their plans, the designing and planning-technological organizations ought to divide projects among the production centers, having determined the extent of the projects' construction and installation work, their expected labor outlays and the extent of their material resource requirements.

In an effort to increase the level of motivation in construction and installation trust collectives and other organizations on the same level regarding economies in the wage fund, it has been established that fund economizing, calculated based on the actual volume of construction and installation work completed in one year, remains at the command of the construction and installation organization, and is counted as part of the material incentive fund.

Administrators of trusts and other organizations of equal status have been given the right to fix, in agreement with trade union committees, and through economies made in the wage fund, increases to the wage rates of highly-skilled workers involved in especially critical jobs, these increases stemming from their professional skill (increases of up to 16 percent for 4th-category workers, up to 20 percent for 5th-category workers and wage rate increases of up to 24 percent for 6th-category workers). These increases are reduced or are completely revoked should the work indicators take a downturn.

It has been ascertained that the overexpenditure of this fund which has been allowed to occur is subject to compulsory reimbursement (within one year from the time it was incurred) through savings in the wage fund or paid for by the material incentive fund of the construction and installation trust, or an organization of equal status, and should the reimbursement monies be insufficient, it will be paid back out of the reserve wage fund or the ministerial or departmental material incentive fund.

Should the end of the year find the wage fund overexpenditure still unreimbursed, the remunerations for the entire year's work of leading workers of the trusts and other equal-status organizations are reduced in compliance with current law.

It has been stipulated that beginning with 1985, the planning of the worker strength and the wages for key personnel, engineering and technical personnel (including line personnel) and white-collar workers of construction and installation organizations must be done in compliance with the norms per one million rubles of construction and installation work in keeping with the estimated cost of the work done in a given year. USSR Gosplan, USSR Gosstroy [State Committee for Construction Affairs], the USSR State Committee for Labor and Social Problems and the USSR Ministry of Finances have been charged with the ratification in 1985 of the standards for workers' strength and the wage fund for key personnel, engineering and technical personnel (including line personnel) and white-collar workers per one million rubles of construction and installation work.

It has been stipulated that all the monies wage-fund monies saved, which monies were saved by reducing the numbers of key and engineering and technical personnel and white-collar workers against the amount saved, which amount was provided for in the norm, and which was calculated based on the actual volume of construction work completed in the course of the year, remains at the disposal of the trusts and other organizations of equal stature, and may be used to pay the wage markups on the scale of up to 50 percent of a worker's official pay rate, and this includes administrators of trusts, administrations and organizations of equal stature, line personnel and the administrative apparatus of these trusts and organizations. These wage increases are reduced or completely revoked should the work indicators fall off.

For the purpose of improving effectiveness in the work done by construction and installation organizations, it has been found advisable to introduce raised indicators so as to assign construction, construction and installation, special-purpose, start-up and trouble-shooting, building and repair, renovation organizations of equal stature, to groups according to the wages of their key and engineering and technical personnel. In the course of defining the groups according to their wages, the specific nature and labor intensiveness of the work they do must be taken into account, as must the need to increase the share of the reconstruction operations done by operating enterprises.

USSR ministries and departments and union republic councils of ministers have been given the right to increase the official wage of key and engineering and technical personnel (their wages depending on the group they are assigned to) of the construction and installation trusts and administrations, and organizations of equal stature in those instances where the actual volume of work completed by these organizations greatly exceeds the prescribed indicators for the corresponding group

It has been established that the deadlines which were initially fixed in the annual plans for economic and social development are the same as the deadlines for putting production capacities and construction projects into operation, and the same ones which give the right to award bonuses for their being put completely into operation.

It has been established that when a construction and installation trust, administration or organization of equal status puts all the productive capacities and construction projects called for by the plan for economic and social development into operation, a single worker can, in the course of this year, be awarded a bonus for putting these facilities into operation. The amount of the bonus has been fixed at an amount equal to up to six months' worth of his official salary (wage rates) in a year. Should not all the planned capacities and projects be put into operation, the ceiling amount of the bonus must not exceed four months' worth of official wages (wage rates) in a year. These bonuses are awarded independent of the other work indicators.

The USSR State Committee for Labor and Social Problems and USSR Gosstroy, in conjunction with the AUCCTU, have been charged with setting the ceilings on individual bonuses awarded to workers for putting production capacities or a single project into operation, depending on the normative construction time.

It has been established that monies used for bonuses for putting production capacities and projects into operation are included, within the dimensions envisaged, in the construction estimates. These monies are to be used for no other purpose.

Administrators of construction and installation trusts and organizations equal to them, and administrators of general contracting organizations must, prior to the start-up of construction, determine the conditions for and the amount of the bonuses awarded for putting production capacities and construction projects into operation for each collective taking part in the construction project, as well as for key personnel and engineering and technical personnel. The amount of the bonuses is determined with respect to the nature of, the labor-intensiveness of the work carried out, and the contribution of the corresponding organizations and workers to the final results: getting the production capacities or the construction projects into operation within the set deadlines.

Administrators of construction and installation trusts, and of organizations of equal stature, as well as administrators of general contracting organizations have been given permission to reduce (but by no more than 50 percent) the total of the assets made available for bonuses awarded for putting production capacities or construction projects into operation, whenever the schedules for the execution of these operations are not met. Monies not used in cases such as this are expended by organizations and general contractors in the form of bonuses awarded to workers from other organizations, which workers have helped to speed up the construction and putting into operation of the indicated capacities and facilities within the set deadlines.

Administrators of construction and installation trusts and organizations of equal stature have been given the right to allocate a portion of the monies earmarked as bonuses for putting production capacities and construction projects into operation, and monies earmarked for incentives for the workers of the industrial enterprises which belong to these trusts, as well as for the motor transport organizations' workers who participated directly in the construction of the indicated projects and who aided in the rapid completion of the construction projects.

Permission has been given to award workers' bonuses in the form of an advance to those workers involved in construction projects slated to last over a year, with up to 50 percent of the total of the bonus monies meant for these purposes to be disposed of for putting production capacities and construction projects into operation. The remainder of the total bonus monies is to be paid after the act has been approved in prescribed order by a state acceptance commission for the acceptance of the corresponding capacities and projects for operation within the planned deadline.

Bonuses in the form of advances are paid out for the completion, within the set deadline, of individual assignments and construction stages which have a significant effect on the timely putting of production capacities and construction projects into operation.



The practice of paying bonuses in the form of an advance has been extended to staff workers of construction and installation trusts and organizations of equal stature, workers of production and equipment outfitting administrations and of industrial enterprises which are attached to trusts, as well as to motor transport organization workers who participate directly in the construction of facilities and who help in the rapid completion of the construction, and to customer service and planning-surveying organization workers.

The decree gives administrators of construction and installation trusts and organizations of equal stature, and administrators of general contracting organizations the right to use, having agreed on this with the trade union committees, up to 5 percent of the monies allocated for the payment of bonuses in the form of advances for putting production capacities and construction projects into operation, and for workers' incentives according to the final results of the socialist competition for prompt and high-quality completion of the more important stages of given construction projects.

USSR ministries and departments and union republic councils of ministers have been given permission to award bonuses to administrative staff workers of main territorial construction administrations (all-union construction and installation associations), which workers participated directly and made a significant contribution to the prompt putting of specific production capacities and construction projects, the amount of which bonuses to equal two months' worth of official wages in a year.

In order to enhance the effect of the bonuses to increase the effectiveness of construction and to create the needed construction backlog bonuses are being paid to key personnel, engineering and technical personnel and to white-collar workers of construction and installation trusts and administrations as to organizations on a level equal with them, for the results of their economic activity. The amount of the bonuses is equal to one month's official wage per quarter. These bonuses are paid separately: 50 percent of the bonuses are for completing the quarterly plans for volumes of construction and installation work, with observation of the requirements for quality in construction, and 25 percent each for fulfilling assignments for increases in labor productivity and for reducing the production costs of construction and installation operations.

The indicated bonuses are paid out of the material incentive fund, and are paid to line engineering and technical personnel from savings in the production sections' wage fund as well.

The decree charges construction ministries, departments and main administrations and construction and installation trusts and organizations of equal stature with taking measures to insure complete deliveries of materials, products and structures by construction industry enterprises, production and equipment outfitting administrations and transport organizations, these measures to be considered as important to the development of the brigade and integral-process flow-line contract, as in the improvement of the construction industry.

The USSR State Committee for Labor and Social Problems, and USSR Gosstroy in conjunction with the AUCCTU, with the participation of interested ministries and departments, have been given two months to develop and ratify their position concerning material incentives and increased liability for complete deliveries and for high quality in construction materials, products and structures.

Administrators of construction and installation trusts and equal-stature organizations have been given the right to permit, as an exception, the construction organizations attached to these trusts, the rights of production units, and the right to set up, according to the results of their work, a material incentive fund using the profits earned by them.

12659

CSO: 1821/003

## CONSTRUCTION PLANNING AND ECONOMICS

### QUALITY, PRODUCTIVITY LOW DESPITE HUGE CAPITAL INVESTMENTS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 20 Jul 85 p 2

[Article by Academician T. Khachaturov: "Investment Policy"]

[Text] At the CPSU Central Committee's conference on questions of accelerating scientific and technological progress, the task was set of changing the approach to investment policy, conducting it in a thoughtful and consistent fashion, and moving more decisively to concentrate capital investments in the most economical areas.

Capital investments in our country's national economy are tremendous: every year more than one-fourth of the national income is spent on them. But the return on them is low, and there has been a tendency for it to decline. For example, whereas in the Eighth Five-Year Plan it took 28.4 kopecks of capital investments for each added ruble of national income, in the 11th Five-Year Plan it takes 34.9 kopecks. And the primary reason for the drop in the effectiveness of investments is the discrepancy between the planned volumes of capital construction and the builders' capabilities.

At present about 4.1 million persons are employed in the construction and installation of production facilities. This means that there are, on the average, fewer than 12 workers per construction project. There are not enough material resources for this number of projects, either, although we produce more of them than any other country in the world. We produce 35 percent more cement than the US. Our plants produce 3.5 times as much window glass as American plants and seven times as much precast reinforced concrete structurals. Yet volumes of capital investments in the USSR and the US are nearly equal.

To what can such disproportions be attributed? Take cement. The lower grades predominate in our country, and for this reason the proportional use of it is higher than in American construction projects. Builders prefer heavy structurals made of precast reinforced concrete--they make it easier for them to fulfill their gross output plan. There is extremely little specialized construction machinery--its production is disadvantageous to the machinery manufacturers. And so it works out that our construction potential is great in volume but low in quality. In combination with an excessive number of projects, this results in prolonging construction time and raising its cost.



Even medium-sized projects such as machinery and chemical plants take five or more years to build. If you add a year or two for designing and as many years, or even more, for bringing the plants up to rated capacity, you end up with construction time periods whereby a facility turns out to be technically outmoded by the time it has reached its rated capacity.

The main flaw in present investment policy is the "spreading around" of capital investments. And it begins with the determination of construction costs. In order to squeeze into the plan, the authors of a project strive to "cut" the estimate as much as possible, but once construction has begun they send a flood of petitions to "define it more precisely." And by the time a facility has been turned over for use its cost sometimes turns out to be one and one-half to two times as high as it was before it was included in the plan. To provide financing for it, it is necessary to reallocate funds from other projects and "freeze" what has already been spent on them.

And just why are we afraid of expensive projects? After all, estimates are understated not just by "chopping off" facilities but also by failing to take the latest technological developments into account when designs are drawn up; preference is given to established technology and outmoded machines and equipment. Advanced machinery and technology are costly, but the return on them is greater too. And a facility equipped with them takes the place of several "cheap" and small ones. So is it worthwhile, for the sake of illusory economy, to introduce disorganization into the planning of capital investments and spend them on the creation of "yesterday's" assets?

Of course, this does not mean that all new construction, in general, should be curtailed. No economy can do without it. But new projects should be begun with careful consideration and only in the event that the possibilities for increasing production at existing facilities have been exhausted, or when the objective is to sharply accelerate the development of a given branch. In this case it is necessary to select designs on the basis of their technical and economic level and apply in practice the principle of making extremely careful calculations before starting to build. There should be no question here of any sort of departmental or narrowly local approach. There is only one approach--the state approach.

Another, no less complex problem of investment policy is that of disproportions in the structure of fixed assets. For many years in a row now, more than two-thirds of capital investments have been channeled into new construction and the expansion of existing enterprises. But even in new construction there is sometimes a lack of balance: first of all, production facilities are built, and only after that--housing, municipal-service, cultural, consumer-service and trade facilities. The delay in building such facilities is the main reason for personnel turnover and slowness in bringing the most costly production assets up to rated capacity. Once again, hastiness in commissioning facilities ahead of schedule and the pursuit of mythical savings cause serious damage to the national economy and undermine our chief advantage--planned proportionality in economic development.

Another serious disproportion arises and grows because of a delay in replacing worn-out fixed assets. On the average, fixed production assets in industry are increased by 7 percent a year, and assets worth only 1.3 percent of their total value are taken out of use. It is impossible to keep up with technological progress this way: old equipment weighs heavily on an enterprise's balance and makes it impossible to fully realize the potential of the new.

Fixed assets grow not only outmoded but physically obsolete. More than one third of all machinery and equipment is simply worn out. And this has an extremely unfavorable effect on the level of labor productivity, impeding its growth. Another unpleasant consequence is the bloating of maintenance and repair services. Six million people are employed in the repair of obsolete equipment, and more than 35 billion rubles a year is spent on it; it takes one in every five tons of ferrous metals and occupies one in every four machine tools.

It is possible and necessary to free ourselves from these consequences of errors in investment policy. Three stages are perfectly feasible. The first is an overall inventory of assets, especially production assets. Many enterprises possess a tool for doing so. I am referring to the process of completing data-registry documents [pasportizatsiya]. Now it makes sense to orient this process more definitely toward the development of long-range plans of technical reconstruction. And this would be the second stage. The third consists of the systematic replacement of obsolete assets. The goal is clear: replace one-third of all production apparatus with new equipment over the course of the 12th Five-Year Plan, while raising the overall percentage of new machinery to 50 percent--not just machinery that is new in terms of its production date but that which yields the highest possible economic and social effect.

In order to accomplish such a large task it is necessary to make serious adjustments in investment policy. I have in mind approximately doubling capital investments in the machinery industry. Striking disproportions have developed there. For example, investments in the chemical and petroleum machinery industry amount to only one forty-seventh of investments in the branches for which this industry works. There is also a need for a certain redistribution of investments among the branches that provide the machinery industries with initial materials, especially rolled metal and electronics and electrical-engineering equipment that are of a higher quality than at present.

Our need for capital investments in the extractive branches is still great. The only way this need can be reduced is through a rational use of raw material, fuel and other materials and secondary resources. Of course, it will be necessary to increase investments in the development of resource-conserving machinery and technologies and more economical machinery units for electric power stations, and in the development of heating plants and networks. Additional capital outlays will be required for improving product quality and for the reprocessing of production by-products. The outlays will be sizeable, but they are unavoidable and they must be boldly undertaken: they will pay off threefold.

Such changes in investment policy will require considerable capital investments. There is only one source for them--an increase in national income. Every ruble spent on capital construction should be recouped within the normative period or sooner. There are also reserves even closer at hand. For example, the certification of workplaces is helping to significantly improve labor productivity and the return on assets without additional investments. The dissemination of this experience should also be regarded as a constituent element of investment policy and must be taken into account in planning capital investments for reconstruction.

A second major reserve is a restructuring of the management of the investment complex. Besides "pure" construction, this complex also includes the industrial branches that produce building materials for new facilities and the reconstruction of existing ones. Taking their "weight" into account, the percentage of people employed in this complex comes to approximately 20 percent of the total number of employees in material production, and the share of fixed production assets in the complex comes to about 9 to 10 percent of the total in material production. And it would be a good idea to examine the possibility of coordinating the entire construction and industrial complex.

I realize that this is no easy task, but accomplishing it is made easier by the fact that we have such an agency as the USSR State Construction Committee. At the present time it concerns itself with general questions of unified technical policy for construction and architecture and the development of technical specifications and estimate norms, rates and price lists. Isn't it time to assign the USSR State Construction Committee more specific tasks related to management of the entire construction and industrial complex, the coordination of work and supervision of the activities of the construction ministries and that part of industry that supplies the needs of capital construction? Comprehensive management would contribute to the pursuit of an active and purposeful investment policy and the correction of existing shortcomings in capital construction--shortcomings which have long been known but have not yet been eliminated--and would play a great role in enhancing the efficiency of social production and speeding the pace of work.

8756

CSO: 1821/ 174

## INDUSTRIAL CONSTRUCTION

### UNDERUTILIZATION OF CONSTRUCTION CAPACITY QUANTIFIED

Tashkent EKONOMIKA I ZHIZN in Russian No 1, Jan 85 pp 32-33

[Article by Candidate of Economic Sciences P. Podkladov, senior associate at the USSR Gosstroy Scientific Research Institute of Construction Economics: "Balancing Capital Construction Plans"]

[Text] A capital construction imbalance persists in the republic economy. This results from the failure of the construction front, the amount of construction-installation work being done at any one time, the capital investment resources and the capacities of construction organizations to correspond to one another. The percentage of plan non-fulfillment remains quite high, due to the inadequate provision of contractor organizations with production capacities. This is a consequence of shortcomings in contractor work planning, which sometimes does not take into account the actual potential of the construction-installation organizations.

Such consideration is possible only on the basis of a precise calculation of organization production capacities, that is, the maximum annual volume of SMR [construction-installation work] which can be done using their own resources. These calculations provide an accurate description of the technical-economic potential of these organizations and enable one to evaluate production reserves. Reliable calculations of these capacities must become the basic initial document for planning construction organization loads.

In 1983, the USSR Gosstroy's Scientific Research Institute of Construction Economics completed a three-year inventory of the capacities of a large number of construction organizations, including 16 Glavtashkentstroy [not further identified] trusts.

Evaluations of actual construction organization capacities creates only a prerequisite for balanced substantiation of a construction program. They must be supplemented by calculations of the planned production capacity requirements of the organizations. Planned requirements are computed as the relationship between planned work volume and planned production capacity use factor.

Planned production capacity must be calculated when working out the organization economic and social development plan with a yearly breakdown of assignments. Five-year plan annual assignments by amount and level of production capacity use must become the basis for drawing up annual construction financial

plans, summing up the results of plan fulfillment, and filling in the organization passport [license: certificate registering technical and operational data].

The planned average annual production capacity of a construction organization ( $C_p$ ) is determined on the basis of development of a plan balance, which is compiled using the formula:

$$C_p = C_{ac} + C_i \pm C_m \pm C_s ,$$

where  $C_{ac}$  is the actual production capacity at the end of the base year;  
 $C_i$  is the production capacity dynamics due to intensive factors;  
 $C_m$  is production capacity dynamics due to change in availability of construction machinery;  
 $C_s$  same, due to change in number of workers.

The next calculation stage determines the planned production capacity use factor. This indicator is the basis for calculating the balance factor ( $F_b$ ), which establishes the degree to which a planned construction-installation work program conforms to the planned production capacity of the organization.

Balance is achieved if  $F_b = 1$ . If it does not, this signifies this balance does not exist. In that case, two variants are possible:

- a) presence of bottlenecks in the development of production capacities, so that the planned construction programs cannot be carried out in full;
- b) presence of excess capacity, not operated at full load when carrying out the planned work volume.

The calculations show that, in a majority of construction organizations, including Glavtashkentstroy trusts, this correspondence of construction-installation work plan indicators to production capacities has not been achieved. The data in the table testify to the fact that the available capacities have not been operating at full load.

#### Indicators of Production Capacity Use at Glavtashkentstroy Construction-Installation Organizations and Their Balance With Contractor Work Plans

	use factors			balance coefficient
	(1)	(2)	(3)	
"Stroymekhanizatsiya" trust	0.88	--	0.877	1.02
Tashkent DSK-1	0.875	0.849	0.907	1.009
Tashkent DSK-2	0.88	0.922	0.902	1.027
"Vysotstroy" Trust No 11	0.88	0.963	0.905	1.08
"Tashinzhstroy" trust	0.925	0.995	0.952	1.099
"Otdelstroy" trust	0.74	0.98	0.929	1.14
"Otdelstroy-2" trust	0.633	0.993	0.917	1.2
"Zhilstroy: trust	0.94	0.96	0.956	1.123
"Tashtransspetsstroy" trust	0.734	0.875	0.802	1.14
Trust No 3	0.88	0.887	0.907	1.27
Trust No 4	0.88	0.96	0.902	1.12
Trust No 6	0.88	0.957	0.912	1.06

[continued, with key, on following page]

[Table, continued from preceding page, with Key:]

	use factors			balance coefficient
	(1)	(2)	(3)	
Trust No 8	0.94	0.95	0.968	0.8
Trust No 12	0.92	0.9	0.911	1.2
Trust No 153	0.88	0.946	0.908	1.056
Trust No 159	0.85	0.95	0.896	1.1

Key:

1. Machinery resources
2. Labor resources
3. Production capacity as a whole

Judging from these data, the balance factor is close to 1 (one) in a number of trusts ("Stroymekhanizatsiya," DSK-1 [house-building combine No 1], "Vysotstroy" and Trust No 6). The gap is quite large for several organizations (Trust No 3, "Otdelstroy No 2," Trust No 12 and others). This signifies that these organizations had relative surplus capacity. One exception is Trust No 8, which had a shortage of capacity.

It is evident from the table data that there are reserves available in the use of capacities.

Improvement in the balance between production capacities and construction programs of Glavtashkentstroy organizations will be facilitated by the development of steps (both by the construction trusts themselves and by superior planning links) to increase construction-installation work volumes so as to ensure that capacities are more fully loaded. In particular, we might anticipate such measures as:

doing work for outside organizations on the basis of subcontractor agreements;

including additional projects in trust construction programs;

changing start and finish dates for projects included in trust five-year programs.

Implementation of these and other measures would do much to increase the effectiveness of the production potential of the Glavtashkentstroy.

The problem of construction plan balance includes a number of aspects which go beyond the framework of the construction organizations. We stated above that the USSR Gosstroy NIIES has accumulated specific experience in calculating construction capacities, and this includes territorial construction organizations (main administrations), as well as contractor organizations.

Such calculations enabled us to conclude, in particular, that the small capacity of production-base enterprises is one limiting factor for such organizations. It is therefore necessary to combine the capacities of construction subdivisions and enterprises producing components and parts in order to achieve a full construction balance.

This is also a pressing problem for the Glavtashkentstroy, which has available to it a production base whose capacity is not always properly linked to the requirements of the construction trusts. In individual instances, the opposite trend has been noted, that is, for the capacities of base enterprises to exceed the potential of the construction subdivisions. In particular, this situation was discovered in DSK-1. Calculations made in 1983 showed that the capacity for producing reinforced concrete for series TDSK-71A/77 block-sections exceeded the potential ability of the construction subdivision to use them by 12 percent.

This necessitates the development of methods provisions on calculating the interdependence of the capacities of both subdivisions. Calculations will enable us to determine the level of availability of material resources for planned work, to evaluate the feasibility of plans of enterprises of the production base, and to reveal bottlenecks in the development of capacities. Elimination of the existing disproportions must be the result of these calculations.

It is necessary to calculate indicators not only in terms of estimated cost of work being done, but also in physical units of construction output (square meters of housing, for example). Such indicators must be calculated for each specific type (kind) of project being built.

The calculation plan would thus look like this: capacity is determined in cost terms, by project, in the first stage and in units of measure of end product in the second stage. The first indicator is calculated as the ratio of work volume done on the project to the capacity use factor for the construction organization as a whole. The second is determined as the ratio of the first indicator to the estimated cost of a unit of construction end product.

Such calculations can be made both for actual data for the year and for indicators for the planning period. In the latter instance, data on the degree of capacities use in the planning year and corresponding indicators of planned construction-installation work volumes by project are introduced into the calculation.

As concerns determining the capacities of industrial enterprises, this stage of calculations presents no special difficulties. Such work has long been done at a majority of the enterprises of the construction industry, and the calculation results are included annually in the enterprise passport.

Interdependence calculations are relatively simple and can be made available to the planning agencies of the construction ministries and department. Practical introduction of this calculation system into economic activity will enable us to ensure the balanced development of production capacities of territorial construction organizations and to improve capital construction effectiveness.

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INDUSTRIAL CONSTRUCTION

JPRS-UCR-85-016  
13 November 1985

PLANT CONSTRUCTION DELAYS DUE TO LACK OF MATERIALS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 16 Aug 85 p 3

[Article under the heading: "The Newspaper Has Spoken Out. What Has Been Done?": "'A Schedule for Form's Sake' "7]

[Text] In the report by our staff correspondent R. Tellya published under the above title in SOTSIALISTICHESKAYA INDUSTRIYA of 19 June, the topic of the unsatisfactory construction of the Chardzhou chemical plant was discussed.

The critical remarks expressed in the newspaper, reports USSR Minister of Construction G. Karabayev, have been examined at the ministry. The instances of unsatisfactory work organization by the general contractor, the Chardzhoustroy Trust of Turkmen SSR Minstroy [Ministry of Construction], the lack of coordination of the activities of the subcontracting organizations of USSR Minmontazhspetsstroy [Ministry of Installation and Special Construction Work] and the unsatisfactory completion of units of machinery and special materials delivered to the clients at the construction site did in fact take place.

After the newspaper article was published, the administrators of Turkmen SSR Minstroy, along with responsible officials from Minmontazhspetsstroy USSR, examined the course of construction of the chemical plant in Chardzhou. Additional measures for beefing up construction and installation operations were defined in an order from Minstroy USSR. Time periods were established for completing construction projects at the plant. The course of the construction work is under continuous surveillance.

A response to the report was also received from the All Union Soyuzosnovkhim [possibly, Basic Chemical Production] Association. V. Kornienko, deputy chief of the association, admitting the correctness of the criticism of the plant directorate, reports on the measures taken. A group has been organized at the plant for completing units of equipment and materials, to include the technological pipelines. However, in the process of the work, the technological lines hauled into the installation zone are not being properly stored.

While the responsible representatives of Soyuzosnovkhim were conducting their inspection, 17-21 June 1985, it was determined that the general contractor at the building site was not sufficiently supplied with the required resources. This was basically also the reason for the unsatisfactory fulfillment of the construction plan in the first half of the year.



All questions concerning construction of the complex were examined at the site. The construction site has been brought up to strength in terms of equipment made in the USSR. All the defective imported equipment and materials were hauled away.

9006

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MIXED RESULTS FROM INVESTMENT IN CAPITAL CONSTRUCTION NOTED

Moscow LENINSKOYE ZNAMYA in Russian 26 Jul 85 p 2

[Article: "Capital Construction"; passages rendered in all capital letters printed in boldface in text]

[Text] FIXED ASSETS worth 541.3 million rubles were put into operation in the first half of 1985 by virtue of state capital investments.

New enterprises were built and existing enterprises were rebuilt and expanded.

State commissions have accepted for operation a capacity for producing mainline diesel locomotives at the Kolomenskiy Diesel Locomotive Works imeni Kuybyshev, a fuel oil storage site at the Chekhov Power Engineering Machine Building Plant, a shop for producing blown articles from polyethylene at the Balashikhinskiy Experimental Chemical Plant, and an 85,000-ton-capacity elevator at the Istrinskiy Grain Products Combine.

STATE CAPITAL INVESTMENTS in the national economy of the oblast amounted to 905.8 million rubles. For technical re-equipping and reconstruction of existing enterprises, 284.2 million rubles were used, which is 10 million more than in the first half of 1984.

A program has been implemented for the reconstruction, expansion and technical re-equipment of enterprises of the light, textile, food, and meat and dairy industries. For these purposes, 52.9 million rubles in capital investments were used, and construction-installation work valued at more than 11 million rubles was carried out.

Fixed assets worth 75.5 million rubles were put into operation under the AUSPICES OF THE MOSCOW OBLAST ISPOLKOM, and 111 million rubles in capital investments were used.

The overall volume of CONSTRUCTION COMMODITY PRODUCTION of the state contracting construction-installation organizations in the first half of 1985 amounted to 276 million rubles, including 182.4 million rubles for Glavmosoblstroy [Main Administration for Construction in Moscow Oblast]. The volume of contract work carried out by the construction organizations through their own efforts amounted to 571.2 million rubles, including 342.5 million rubles for Glavmosoblstroy.

LABOR PRODUCTIVITY in contract construction organizations in the oblast rose by 0.2 per cent in comparison with the first half of 1984, including an 0.3 per cent increase for Glavmosoblstroy.

Inter-kolkhoz construction organizations completed a volume of construction commodity production valued at 5.3 million rubles, and contract work amounting to 13.3 million rubles.

Work was carried out on further strengthening the production base of state and inter-kolkhoz construction organizations.

At the same time there are instances of serious shortcomings in capital construction. Capital investments continue to be frittered away, as a result of which the time periods for construction are drawn out. Plans were not fulfilled for putting fixed assets and production capacities into operation. A number of construction organizations in the oblast (the trusts Mosoblstroy No 16 in Zaraysk; Mosoblstroy No 26 in Ramenskoye, Osoblstroy No 2 in Lytkarino, Mosoblstroy No 20 in Pushkino, and Mosoblstroy No 8 in Naro-Fominsk) and Glavmosoblstroy as a whole have not fulfilled their plans for construction commodity production. Certain construction organizations have not been coping with their tasks for growth of labor productivity and profits and for reducing the production costs of construction-installation work; and the growth rates of average wages have outstripped the growth rate of labor productivity.

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## INDUSTRIAL CONSTRUCTION

JPRS-UCR-85-016  
13 November 1985

### CONSTRUCTION TRUST FAILS TO MEET PLAN TARGETS

Alma-Ata NARODNOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 7, Jul 85 pp 56-60

[Article by D. Berdiyev, chief economist of Embaneftstroy Trust, under the rubric "Capital Construction": "To Strengthen Planning Discipline"]

[Box insert] Unsuitable work style of the client leads to above-plan losses

New opportunities for stimulating quality and highly productive work

Outstripping development for the Trust's own base

Improve the structure of the contractor's economic service

[Excerpts] The Embaneftstroy Trust was organized in 1972 to build projects of the Embaneft Production Association on the territory of Guryev and Mangyshlak oblasts. It has four construction-installation contracting organizations. During the years of its existence, the trust collective has built the oil fields of Prorva, Kamyshitovoye, Martyshe, Rovnoye, Kenkiyak, Tengizskoye and many others.

In four years of the 11th Five-Year Plan the trust assimilated R25 million of SMR [probably construction and installation work] under the general contract, it sold R22 million of commodity construction products, and it placed in operation 125 oil wells and 16,200 m<sup>2</sup> of well-planned living space. In short, the builders are making a definite contribution toward implementing the program for building up capacities of oil fields in the region and for improving the living conditions of Emba oil workers.

It must be admitted, however, that the trust collective worked below its capabilities in 1984. For example, the plan was unfulfilled for a number of positions. The deadlines for turning over 15 oil wells, an ATS [automatic telephone exchange] for 5,000 numbers, a kindergarten for 280 in Guryev and other projects were not met. Oil workers were shorted 1,600 m<sup>2</sup> of living space. The plan for selling commodity construction products was fulfilled by 44 percent, the plan for volume of construction and installation work under the general contract was fulfilled by 53 percent, and the quota for a growth in labor productivity was fulfilled by 73 percent. Above-plan losses of R179,000 were allowed. It is the first time in 12 years that the trust has had such low indicators.

Just why did the trust turn up among the laggards? There are many reasons, the principal one being violations of planning discipline by construction participants which led to a dissipation of material and labor resources and to poor engineer and economic preparation of production.

Last year the trust was not provided with planning estimates of R3,051,000, or 32 percent of the plan, just through the fault of the principal client, the Embanefit Association. At the same time, it built an unplanned project for the association--a four-apartment house in the settlement of Makat--which led in the final account to above-plan losses amounting to R42,000 and to the builders' collective being deprived of a 13th wage.

The trust committed a similar very crude breach of state planning discipline in 1983 as well. Construction of another project in Guryev which was not included in the capital construction plan was carried on under the appearance of a six-apartment house. The Guryev Oblast office of USSR Stroybank [Bank for Financing Capital Investments] attributed costs of its construction (R131,000) to the contractor's primary work. Above-plan losses formed as a result and the collective was deprived of an opportunity to set up a material incentive fund. The USSR Minnefteprom [Ministry of the Petroleum Industry] also was at fault for this to no small extent. It shuts its eyes to the breach of state planning discipline by allowing the Embanefit Association and the trust to perform unplanned work.

Deficiencies in providing fund construction materials also had a negative effect on fulfillment of the program for construction and installation work. In 1984 the Association's Administration of Industrial Production Support and Batching (UPTO i KO) did not deliver various materials for construction and installation work to construction sites amounting to R716,000, or seven percent of the plan. In particular, the trust was shorted in the supply of 3,120 m<sup>3</sup> of shell rock block, 402,000 pieces of common brick, 3,873 m<sup>3</sup> of reinforced concrete structures, and other materials. In addition, the builders also suffered unplanned losses because of exceeding the prescribed norm of supply-sale price mark-ups of the Association's Administration of Industrial Production Support and Batching (by R119,000). The fact is that the price handbooks for shell rock blocks and common brick sold to sovkhozes and kolkhozes were not promptly revised although the trust repeatedly appealed to the Guryev oblispolkom. If the situation is not corrected, the builders will have substantial losses this year as well for this reason.

The irregular planning of the sale of commodity construction products is one more miscalculation which strikes against the contractor's economics. According to the plan for the fourth quarter of 1984, 55 percent of the year's amount of construction products were to be turned over to the client. Such an irregular distribution of volume led to crash work and a drop in quality of the work performed, and it forced a turnover of projects with unfinished work which had to be remedied at the beginning of the current year. This naturally had a negative effect on labor productivity and on the contracting organization's financial and economic activity.

In 1985 it was planned to sell 49 percent of the year's schedule of construction products for the fourth quarter. This means they were unsuccessful in avoiding crash work.

There were also errors in planning labor productivity and average wages. For example, a 4.6 percent increase in labor productivity was planned for the trust for 1984, and a reduction was even planned for some of its subunits (by 27.4 percent for SMU [Construction-Installation Administration]-3, 2.3 percent for the special construction-installation administration, and 24.2 percent for the PMK [mobile mechanized column]).

It is common knowledge that the growth in labor productivity should outstrip average wages. There is an optimum ratio in construction: there should be a 0.4 percent growth in average wages per one percent growth of labor productivity.

That ratio of the two indicators is upset in the trust.

A 2.4 percent growth in average wages was planned for 1984 with a 4.6 percent increase in labor productivity, but the proportion was as follows for certain subunits respectively: SMU No 1--2 and 8.8 percent, SMU No 3--27.4 percent and 10.9 percent, the special SMU--2.3 and 1.5 percent, and PMK No 2--24.2 and 11 percent respectively.

Such an approach to the planning of two basic indicators of the contractor's economic activity unquestionably leads to an overexpenditure of the wage fund. True, last year we succeeded in avoiding this undesirable phenomenon. A R3,100 saving of the wage fund was obtained even for SMU No 1, and a saving of R5,300 for SMU No 3. But that saving formed exclusively because of a lack of worker cadres. There was a shortage of 276 workers for the trust as a whole for the planned volume of work. As a result the construction and installation work was underfulfilled by R2,118,000, or 22 percent of the plan.

It should be noted that the presently existing procedure for determining labor productivity based on the estimated cost of construction and installation work has its shortcomings. This was the reason why many economists today explain production difficulties as being due to the imperfection of this indicator. For example, they tie in the late turnover of projects for operation with the unprofitability of performing labor-intensive work remaining in the final stage of construction and, conversely, they tie in an increase of incomplete production with the profitability of materials-intensive operations performed in erecting the building framework. A hold-up in using cheaper structural materials in construction is regarded as nothing more than the pursuit of volumes of construction and installation work performed according to the estimated cost. All this led to a need to compute labor productivity according to normalized-standard net output.

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## HOUSING CONSTRUCTION

### BUILDERS PRESSED TO EXPLAIN SHODDY CONSTRUCTION WORK

Minsk NARODNOYE KHOZYAYSTVO BELORUSSII in Russian No 2, Feb 85 pp 22-23

[Interview with Vasiliy Kuzmich Gorevoy, brigade leader of Mogilev Construction Trust No 12; Vladimir Aleksandrovich Mazurenko, party committee secretary of Mogilev Construction Trust No 12; Tamara Nikolayevna Prokhorova, deputy of the USSR Supreme Soviet, and Yevgeniy Gavrilovich Yekaterinichev, brigade leaders of Lavsanstroy Trust No 17; and Svetlana Vitalyevna Zharenikova, painting brigade leader of a house-building combine, by NARODNOYE KHOZYAYSTVO BELORUSSII stringer Vladimir Yadrentsev; date and place not specified; under the rubric "Quality Is the Mirror of Work": "The Warranty Is a Worker's Honor"]

[Text] Our country is implementing an extensive program for the construction of housing and of social-cultural and domestic services projects. Meanwhile, the quality of housing does not always satisfy people who have just moved in and who sometimes are forced to expend great effort for the repair of new apartments.

How can this be avoided? What must be done to ensure that everyone engaged in building houses works conscientiously and has a creative attitude toward the assigned job?

This was the topic in a roundtable discussion in which the following participated: Vasiliy Kuzmich Gorevoy, brigade leader of Mogilev Construction Trust No 12; Vladimir Aleksandrovich Mazurenko, party committee secretary of that trust; USSR Supreme Soviet deputy Tamara Nikolayevna Prokhorova and Yevgeniy Gavrilovich Yekaterinichev, brigade leaders of Lavsanstroy Trust No 17; and Svetlana Vitalyevna Zharenikova, painting brigade leader of a house-building combine.

Journal stringer Vladimir Yadrentsev led the discussion.

Yadrentsev: To begin with, here is an excerpt from a letter to the editors from Bobruysk resident Barashko: "We moved into a new apartment house in 1979 and have been suffering all this time. If it rains or the weather is damp the walls of our apartment become wet. As we understand it, the builders did a

poor job sealing the joints. In addition, there are frequent interruptions in the water supply in the apartment house, and there is no water at all in summer. And so I would like to ask the builders: Have they really completely lost a sense of responsibility for the assigned job?"

This is obviously not the first time you have heard such complaints?

Gorevoy: Alas, no. Poor quality is a disease of ours. I believe that the manufacture of materials being supplied has to be improved above all. Above all! It often happens that a particular panel is delivered for massive-block construction, but it is impossible to install. It has been entirely rushed through. The supplying plants are pushing the plan and pay no attention to quality. Often we are already building the ninth story and small parts for the first haven't been received. And so you don't work for quality, but merely to turn the house over for finishing.

Now there are many complaints that walls in the large-panel buildings leak. The new residents accuse the builders of everything, but try to understand us as well. We were given a carpenter shop which was not glued and which had gaps of up to five millimeters between the doors. The wooden drip molds were nailed on with a reverse pitch. Slanting rain gets under the drip mold, the water seeps between the doors, and there are your leaks. So it is not a matter of joints. I don't know what enterprise supplies the defective carpenter shop, but we receive it from our administration for production equipment sets.

The 7th ZhBI [Reinforced Concrete Articles] Plant supplies us with ceiling tiles. The form in which they are made is lubricated with solar oil, and the tiles accordingly are soiled with the oil. A painter paints them and some time later black spots come through the whitewash of apartment ceilings.

And one more thing. There is total disorder for two weeks before the project is turned over for finishing work. The pneumatic drills and compressors hammer like machineguns. Why don't the planners incorporate all holes for the plumbing and for electricity for the manufacturing plant in advance? But this doesn't happen!

If each participant in the construction assembly line performed all functions for which he is responsible honestly and conscientiously, then the quality invariably would improve and the turnover of housing would accelerate.

Yadrentsev: The republic now is conducting an economic experiment, the purpose of which is to unify the efforts of planners, builders and suppliers and to remove the contradictions of their departmental interests.

Gorevoy: Something naturally has to change for the better, but for now, I repeat, there are ten or twelve suppliers at a project. Let's say that a plant supplies unsuitable structures; just try to reject them and send them back--you won't receive any at all. I already am convinced of this from my own bitter experience.



Yadrentsev: Vasilii Kuzmich, what if, let's assume, it is a plant of your trust?

Gorevoy: Our plant makes only small components, but if it supplies an inferior product, I go to the manager, to the party organization secretary and to the chief engineer. Here we can take effective steps, but it is impossible to coordinate with an "outside" supplier, as with our Mogilev Brick Plant, for example. It constantly puts out nonstandard products not conforming to the GOST, but our complaints to it are like water off a duck's back.

Yadrentsev: The finishing tile sometimes falls off entire walls on new buildings in Mogilev as, by the way, they do in practically every city. This causes just indignation. It pains one to see that which should serve for decades fall apart in a few months.

Gorevoy: The builders are to blame here as well. Why is coping tile laid? To keep the walls from leaking. This means the tile joints have to be calked with cement mortar and rubbed down with dry cement. If these joints are not sealed, water will leak behind the tile with a slanting rain. When it freezes everything will crack and fall off. But there is another reason: poor quality of the brick. It rapidly deteriorates and falls off together with the tile under the effect of temperature fluctuation.

Yadrentsev: The brigade leader from the general contracting organization said a great deal about what quality depends on and how to avoid deficiencies. Many alterations also occur through the fault of the finishers, particularly painters and plasterers.

Prokhorova: Not everything is going smoothly for us as well. Work performance is disrupted through the fault of planners. The plasterers begin finishing, but plumbers and electricians still come behind them. Alterations cost us dearly: much paint and supplies are used.

Zharenikova: I basically agree with Tamara Nikolayevna [Prokhorova], but I would also like to say a word about poor quality of materials which cannot always be made up for by good work. There would be less criticism if we received wallpaper in light tones and good paints.

Yadrentsev: The new residents primarily address their complaints to finishers.

Prokhorova: Naturally, since we finishers complete the entire work cycle, and there is a greater demand on us.

Yadrentsev: Yevgeniy Gavrilovich Yekaterinichev has ideas about the problems of improving construction quality.

Yekaterinichev: Materials of course are an important factor, but quality basically depends on people. If a professional builder is working, that means he will ensure that there will be no alterations. If our native city of Mogilev had more like Vasilii Kuzmich, who has worked almost a half-century in construction, then our houses would be sound and of good quality.

I have had occasion to build housing, everyday social and cultural service projects, and even a unique facility, the Khimvolokno Association Palace of Culture. What do I wish to say? Each one of our brigade members now has mastered several related trades, but each one definitely has a favorite trade in which he puts special effort. It is pleasing to look at his work.

I have three sections--installers together with welders, concrete workers, and bricklayers. All are masters of their work. Why would I send that same welder to do concrete work? No matter how he tries, he will not perform this work like a professional concrete worker. I believe that specialization is mandatory.

Now concerning the supply of materials. Let's assume that a house has to be built. The fact is, materials can be selected and ordered in advance so that they are warehoused and complete, and then they can be supplied on requisition. Why isn't this done? Or take what Tamara Nikolayevna said: the processing method must be followed. Correct! It is very vexing to the painters. They are the last to leave a project. Then you see the plumbers coming behind them. In my opinion this is stupid bungling.

Yadrentsev: Do you believe it correct that a majority of residences are turned over for operation in the fourth quarter?

Prokhorova: Of course it is incorrect!

Gorevoy: If we turn over in the fourth quarter, the general contractor will not make all civic improvements. In places it is frozen and in places it is touched with the frost, and civic improvements are done in the spring of the following year. Hence the just censure.

The fourth quarter is the most difficult for builders. Party committee secretary Vladimir Aleksandrovich Mazurenko can confirm that the turnover of half of this year's projects again is planned for the fourth quarter.

Mazurenko: Yes, nothing for the first quarter; but still it's not the fourth. That's how our ministry plans it. We are simply not given materials for the below-grade work or for engineering facilities. They go only for projects to be turned over. In the fourth quarter the finishers, general contracting organizations, plumbers and electricians gather at the projects. What kind of good quality is this? This practice can and must be broken.

But people of course, and their attitude toward the job, are the important factor. Here in Mogilev we have many excellent builders. The prestige of this trade must be elevated even more. It would be well to put up memorial plaques if they have built well. Let people know who built it. And competition should be held for the best house among finishing brigades and among general contracting organizations. The builders' work should not cause censure. The principal warranty of this is the workers' honor.

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## HOUSING CONSTRUCTION

### CENTRALIZED PLANNING BLAMED FOR DRAB HOUSING STYLE

Moscow SOVETSKAYA KULTURA in Russian 18 May 85 p 3

[Article by I. Badamyan, architect, candidate of philosophical sciences, Moscow: "Does the Village Need New Suburbs?"]

[Text] Faceless and monotonous villages built up with identical multistory structures in which it is uncomfortable and joyless to live alas are not that rare. An architect reflects on the reasons for this phenomenon.

One of the most important features of the present stage in the development of the village is the mass construction of residential and public buildings by industrial methods. More than 97 million square meters of total area were turned over in the rural area during three years of the current five-year plan. Construction also will proceed at rates that are no less high in the 12th Five-Year Plan as well. The majority of residential and public buildings are built from massive blocks and panels according to standard plans. Half of all farm-type buildings lately have been built by industrial methods and under standard plans.

We have many successes in rural construction. Seltso and Pavlovskoye near Leningrad, Selskaya Nov and Druzhba in Podmoskovye, Verkhnyaya Troitsa in Kalinin Oblast, Serkovo in Gorkiy Oblast, Mokrintsy, Kadashi and Shlyakhovaya in the Ukraine, Lenino, Malech, Snov and Vertilishki in Belorussia, Romaneshty in Moldavia, and Yuknaychay and Daynava in Lithuania are widely known, but these are examples which generally stand out. How do things stand in the ordinary, nonexperimental villages? In order to understand this, let's analyze the experience of the Russian Federation, which accounts for a large portion of space being introduced in the village.

The experience of mass industrial construction in villages of the Russian Federation, which for now is not extensive, nevertheless has revealed serious problems. Above all, the standard farm house is too costly. The cost of one square meter of its total area reaches R420, and in some cases R500 or more. A two-family house costs from R60,000 to R100,000. In addition, standard houses do not permit the efficient accommodation of all kinds of rural families, since they primarily include large three or four-room apartments. Small families have to be settled either with a great overexpenditure of area or

each family in a room. As a result, previously unknown communal apartments have appeared in some villages. At the same time, an inflation of the occupation norm leads on the whole to increased cost of construction by approximately 25 percent. Due to the high cost of houses, the state is forced to assume almost half of the expenditures of cooperative housing construction in the village.

Standard series of residences for the rural area drawn up in a centralized manner do not take account of specific conditions of different areas, and so they have to be revised locally, and sometimes very substantially. For example, only four of the 49 standard plans recommended by the RSFSR Gosstroy for building in Krasnoyarsk Kray are being used in construction, and that after their almost total revision.

Here is another example. Series-produced houses with a high gable roof without a socle are being built in the village of Chaatyr in Rostov Oblast. Next to them, individual builders are erecting housing with a low pyramidal roof, tall socle and half-basement similar to those built by their fathers and grandfathers. A peasant needs a basement to store vegetables and the low roof is fully suited to the snowless steppe. It is a pity that present architects scorn the experience of many generations of local builders!

Unfortunately the new industrial construction of a majority of villages with standard multi-apartment and farm houses is depressing with the dullness and facelessness. This is not surprising when we consider that identical rural housing construction combines producing identical standard homes are located throughout the territory of the RSFSR. One can find entire rural streets made up of buildings as alike as two peas in a pod. Such settlements also are likely to spring up soon. In order to brighten up the monotony in some way it is necessary to go to the unnatural embellishment which was condemned many years ago in the practice of urban construction. In places wooden cornices, crosspieces and other elements are being attached to the facade of reinforced concrete houses already built. It is becoming a matter of obvious absurdities. For example, concrete panels of standard houses in Astrakhan Oblast, where timber is worth its weight in gold, are being covered with wooden laths!

The small village house is still lucky: people think about it and decorate it. The fate of its multi-apartment brother is much sadder. Recently built multiple-apartment buildings in a majority of republic villages are copies of city buildings, only sometimes they are shorter and lower. Moreover, far from the best city series are being built in the village. Meanwhile, the rural multiple-apartment house needs a diversified set of apartments meeting the tenor of life of different families not involved with a subsidiary farm or who do so in small amounts.

Rural multiple-apartment houses, impressive in scale and proportions, must not "kill" the rural landscape as sometimes occurs today but, to the contrary, they must enrich the construction. For now, however, the number of multistory villages solidly built up with identical large-panel structures is multiplying in oblasts and rayons of the RSFSR. The life of the rural family is being crammed into the framework of a city apartment, and often not in its best version, which no longer satisfies even an urban resident.

The experience of national architecture indicates that both local standardization and a unique industrialization existed in the villages in times past. Each specific social and natural-climatic environment worked out its own rational techniques for construction. A house in areas of Russia's North, for example, was compact, utility and household rooms were built on the side of the prevailing winds, and spacious passages reliably protected the entrance to the hut against the cold. This was a fully reasonable and energy-saving construction. Two or three types of houses usually were built in the village. The expressiveness of construction was achieved not by their diversity, but by carefully thought out techniques of composition taking into account features of the relief and landscape. Each peasant precisely knew what he needed and built for himself while figuring his assets accurately.

Now everything occurs differently: those who plan and build rural housing are not the ones who will live in it, and they do this not at all with a thought about economy. It is common knowledge that builders give an account not for houses which are ready, but for capital investments which have been assimilated, and they also receive bonuses for this same thing. It is more advantageous for them to turn over one expensive house than several cheap ones. And so it turns out that the standard farm house with an irregular outline of walls with numerous entrances and verandas, which often resembles a city-dweller's dacha and not a peasant's sensible housing, is both more uncomfortable than the traditional peasant house and costlier. Is it really normal that a house built by an individual builder in Novosibirsk Oblast costs R6,000-7,000, while one built in the same place but with state funds is ten or more times costlier?

Today's troubles of rural industrial construction did not originate today. They arose when decisions were being made for placing identical rural house-building combines in RSFSR rayons which varied in natural conditions and architectural traditions, and when the basic principles of industrial construction for the village were being determined. Today these principles precisely repeat the methods of urban construction and, alas, its mistakes.

The ignoring of the people's experience is not simply a vexing blunder. Standard plans for the village are being drawn up centrally and according to typological characteristics regardless of specific local conditions. The construction norms and rules also do not distinguish among local natural features. The architects essentially are faced with an insoluble problem of the centralized development of rural houses for all instances of life and for the most varying national regions. It looks as if the lessons of mass urban construction did not at all benefit rural construction. Since the beginning of the 1960's various cities in different republics and oblasts were built up for over ten years with identical houses of only two series--464 and 468. And today the plot of the movie "An Irony of Fate" can be fully played out in the village, where two series--25 and 135--also reign.

A plenary session of the board of the RSFSR Union of Architects devoted to functional and esthetic problems of village architecture was held in Novosibirsk in November of last year. Plenum resolutions noted the need for a consistent reorganization of standard planning and industrial construction in

the rural area based on the principles of full-scale regional standardization. The essence of the matter is not to build for the village "in general," but for specific local rural regions similar in their natural climatic conditions. To this end information must be collected and systematized concerning natural, social-historical, demographic and other important features of developing rural settlements, and regional series of standard plans must be drawn up on the basis of this information.

The use of large factory-made parts and structures in the village is justified in far from all instances. It is difficult and costly to deliver them to the interior. Slab construction of light concretes with fillers of local materials or a combination of a slab with the use of factory-made elements is more advantageous in some areas. The return to one's own construction base also means, for many small villages and towns, a solution to the problem of seasonal employment and the possibility of finding a permanent job at home in the village and not in the city. Consequently another urgent task is to determine the methods of industrialization for each region on the basis of scientifically grounded data about local construction conditions, construction materials and road conditions.

The solution to important social problems of rebuilding the village is hampered within the framework of costly and immobile methods of industrializing rural construction existing today. Meanwhile, with proper organization, the expenses of reorganizing planning and construction work definitely will pay for itself thanks to the saving in material resources obtained as a result. The development of regional series of standard plans for residences will facilitate the remodeling of existing rural buildings. The standard plans "indifferent" to local conditions and which prevent new buildings from blending in with the existing ensemble will disappear. The possibility of planning for a specific rural region also will open up broad prospects for mass construction of rural public buildings--schools, children's establishments and cultural centers.

The urgency of these tasks is determined by the fact that now it is very important not to lose time in mass rural construction, not to waste the no small amounts of funds allocated by the state, and not to distort the face of the earth with architecture which is apathetic and indifferent to people's lives.

6904

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CHRONIC DISREPAIR OF HOUSING ASCRIBED TO LOW FUNDING LEVELS

Moscow SOVETSKAYA ROSSIYA in Russian 12 Jul 85

[Article by A. Davydov, SOVETSKAYA ROSSIYA special correspondent,  
Sverdlovsk Oblast-Moscow: "Ispolkom and Factory Housing"]

[Text] Sverdlovsk Oblast-Moscow--"In our small city, there are over 90 small housing-operation offices. So many directors, deputies, engineers, inspection technicians and accountants are receiving salaries! And the return? Buildings have gone unrepaired for years. The courtyards and streets are divided by invisible boundaries. If a pipe breaks, the plumbers spend hours arguing over who has to fix the leak. This departmental "strip farming" causes many inconveniences and problems for residents. There are especially many problems in the fall and winter. These scattered organizations should have been consolidated into a large trust a long time ago. This would greatly regulate the operation and repair of residential buildings.

I. Rumyantsev

Verkhnyaya Pyshma  
Sverdlovsk Oblast

"The problem can't be so simply stated," said G. Pushkarev, chairman of the Verkhnyaya Pyshma Gorispolkom. "The housing and public utilities departments of enterprises have unlimited capabilities. They can cope with their responsibilities much better than we can. What's the sense of transferring departmental residential housing to the Council?"

...Across from the gorispolkom building, on the other side of Krasnoarmeyskaya Street, is the settlement of the Uralelektromed' Combine, the largest enterprise in the city. I decided to find out about this departmental service's "unlimited capabilities." Building No 20 displays a small sign "The residents are striving for the title 'House of Model Living.'"

"We don't remember when that sign was put up," the women sitting by the entrance said sadly.

The building has not been repaired for 20 years. The building looks dilapidated. There are tens of such rundown buildings in the settlement.

I found the director of the combine's residential and public-utilities department, Ye. Krotov, in the factory yard. He was directing a workers' brigade that was sorting a pile of scrap metal.

"You see?" Yevgeniy Leonidovich pointed at the earth, eroded by rain and all covered with ruts and mounds. "This year we can't even get things organized in our own area. How can we go about repairing residential housing?"

While the Uralelektromed' Combine is quite rich, the production base of its residential and public-utilities department is quite poor. The garage, for lack of motor vehicles, stands empty, except for two old machine tools. Supply exists only on paper. The staff is not complete. There are no subcontractors for capital repairs. In extreme cases, they call workers out of the main production shops or else call on private entrepreneurs.

It's this way everywhere. Without any prompting, the directors of other departmental residential and public-utilities departments complained about the same problems....

The gorispolkom's service is coping with its duties well, said Gennadiy Grigor'yevich Pushkarev very modestly. Plans are constantly being fulfilled and there are no complaints from residents about incomplete repair work. That's the way it should be: after all, the gorispolkom has the largest production base and has a reliable subcontractor, the municipal repair-construction administration. You can't help but think of the unanimous opinion which the directors of the residential and public-utilities departments [ZhKO] expressed: that it would be best to transfer the responsibility for all residential housing to the Council.

But why are we trying to force open an unlocked door? Every residential and public utility director--from the ZhKO director to the minister--has on his desk the 1978 decree of the USSR Council of Ministers "On the Further Improvement in the Operation and Repair of Housing." The central point of the document is the transfer of residential housing to the local councils. An order from the RSFSR Minister of Housing and Public Utilities specifies the task: that 10 percent of the departmental housing be taken over by 1985. Overall, they achieved only one third of that. Sverdlovsk Oblast had one of the lowest rates in the country.

Responsible officials are convinced that they're not to blame. The deputy chief of oblast housing and public utilities, Yu. Denisov, knows the decree by heart.

"First of all, transfer housing that does not have systematic technical service and repair and which is the responsibility of small operating organizations," he says, quoting his favorite lines. And he emphasizes:

"Small! In our oblast, housing is mainly the responsibility of large industrial enterprises...."



You will note how skillfully he changes the definitions: the factory ZhKO are called "industrial enterprises." And large ones, at that. Therefore, it turns out that the oblast, with all of its industrial giants, has no need to consolidate the housing.

"Centralization of housing is not a goal in an of itself. It's also important to maintain the housing," continues the interviewee.

This correct sentence masks an incorrect position: you're better off not doing it, if you can avoid it. And they don't do it, although they well know the cost of this inaction. Just remember how many problems there were last year. Pipes broke, the lights went out and entire rayons were without heat and water. It would seem that the harsh lesson should have convinced them to be much better prepared this winter. The ispolkoms of local councils were required to provide reliable and stable operation of municipal services in the coming fall and winter. But again and again we run into the old problems: houses and buildings are run down and kilometers of utility networks are not maintained. And the scattered, feeble public utility services are helpless to improve the situation much.

"If you don't repair a residential building on time, the service expenses increase geometrically," explains the director of the Gosgrazhdanstroy Administration, V. Meshechek. "If you don't take immediate measures, the time soon comes when repair becomes unfeasible--it's cheaper to build a new building...."

Each year in the RSFSR, a total of 100 million square meters of housing requires capital repairs. Only half of it is repaired. The delay, therefore, is increasing. In the near future, the backlog will double: the first large-panel buildings will reach the end of their useful life. They were built less than 20 years ago, but a great number of them are already rundown. Many millions of square meters of housing need immediate repair.

Urgent measures are required, above all by the RSFSR Ministry of Housing and Public Utilities, the lead department for housing operation. Unfortunately, the administrators' activity has been limited to discovering "objective difficulties." The ministry workers do not know the buildings' real condition: they haven't organized any technical inspection. The question of inspections has been on the agenda of collegium meetings more than once, while no one has been personally questioned on the failure of plans. And, is there any basis for questioning them? After all, according to the minister's order, his deputy A. Ivanov, responsible for the consolidation of departmental housing, was required only to "co-ordinate the transfer deadlines."

"What can we change?" says V. Kuzovchikov, chief of the main administration of housing operation, trying to excuse his superior. "Everything is resolved locally. The oblispolkoms don't report to us on this. The resources are distributed to the local councils through other channels than the ministry. It's extremely difficult to monitor the situation...."

But if the ministry can't solve the problem, how can initiative be taken on the local level?

"We must take very resolute steps to change this ingrained attitude," insisted Ye. Rulev, chief of the Sverdlovsk Oblast Housing and Public Utilities Administration. "The oblispolkom session approved an integrated program to transfer departmental housing to the local councils."

We open a folder containing documents on the integrated program. There are long columns of figures and names of cities. Here's Verkhnyaya Pyshma. What changes await it? By 1990, 10,000 square meters are to be transferred to the local council. That's about three 100-apartment buildings...for an entire five-year plan! That's not very much.

This is just one more program approved for the sake of reports. In practice, no one is hurrying to centralize the housing. It's inconvenient for the managers of industrial enterprises to give up their buildings: the buildings need to be prepared for the transfer, and that involves taking care of a lot of things. And the gorispolkom isn't terribly anxious to get more buildings.

Yu. Demidov, chief of the housing and public utilities department, USSR State Planning Committee, summed up this discussion in disquieting fashion:

"As far as transfer of housing to the local councils, I must say forthrightly: this is very far in the future. The problem won't be solved within the next two five-year plans!"

What then about the decree approved seven years ago?

We found the answer to this question in the just-published decree of the CPSU Central Committee, "On Measures Taken by the RSFSR Council of Ministers to Improve the Operation of Housing and Public Utilities." The decree expresses, in particular, concern about how slowly the problems connected with the transfer of departmental housing to local council ispolkoms are being resolved. There's one other circumstance that should be considered. No matter whose they are, the residential buildings must still be the concern of the local council, which is the main proprietor in any city, settlement or residential area.

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JPRS-UCR-85-016  
13 November 1985

## CONSTRUCTION MACHINERY AND EQUIPMENT

### INDUSTRY LEADERS ADDRESS SHORTAGE OF HEAVY CONSTRUCTION MACHINERY

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 20 Jul 85 p 2

[Article by T. Snigirev, deputy editor for party affairs: "Procrastinating is Easier: From the Meeting of Party and Economic Activists of the Ministry of Construction, Road and Municipal Machinebuilding"/

[Text] Review the estimates -- this was the demand heard at the meeting of party and economic activists of the Ministry of Construction, Road and Municipal Machine Building that was considering the sector's problems of scientific and technical progress.

"Will be" was the most popular phrase in the report of Minister V. Chudin and in many of the speeches. Life demands the output of new equipment capable in many ways of increasing labor productivity. Production will be cut back of under-powered excavators, bulldozers, scrapers, graders and cranes on wheeled or tracked chassis. They will be replaced by systems of machinery and equipment supplied with microprocessors, standardized multipurpose chassis with a wide choice of operating equipment, and more powerful loaders and crane trucks.

All this work to improve the product structure will be carried out during the next five-year plan.

The ministry will convert to a two-component managerial system. Several scientific research institutes will be put into associations. Beginning with the new five-year plan, the ministry will be operating under the terms of an economic experiment...

All this will be. Meanwhile, the sector is fulfilling its plan by producing the planned numbers of under-powered cranes, graders, scrapers and bulldozers that do not permit a sharp increase in productivity or a reduction in the amount of manual labor in the sectors using the equipment.

It was noted at the meeting that the structure that has developed in the inventory of construction machinery does not correspond to the contemporary requirements of the construction industry. Half the workers in construction

are engaged in manual labor, which is considerably more than in other sectors of the national economy. The situation is even worse for finishing work. There is still much manual labor in heavy earth and concrete operations. Construction's need now is not for a quantitative increase in the machinery inventory, but for more efficient equipment.

The ministry is not producing that kind of equipment. The output of piling equipment has not been mastered -- it has to be purchased abroad. There is a crying need for multipurpose mini-machines with an extensive array of attached equipment -- but there are none of these either. There is a need for equipment to handle concrete slabs throughout the entire work cycle -- but they are not produced either, and must also be purchased with hard currency. Construction workers have a lot of complaints about the reliability and the quality of the machinery produced by the ministry.

How can we get from the situation that has developed to the one that is to be? One speaker voiced serious complaints against the collective of VNIISTROYDORMASH /All-Union Scientific Research Institute of Construction and Road Machinery/. The institute has produced unsuccessful designs, does not have a strict technical policy, inflates the inventory of machinery, and has an indecisive and passive attitude toward advanced technology.

We must say that the criticism sounds as if the institute was not a part of the ministry. And as if the ministry's personnel bore no responsibility for all these shortcomings and miscalculations.

The institute's general director, E. Kuzin, agreed with the criticism. He admitted that the institute's proposals for the plan for 1986 do not correspond to the requirements of the CPSU Central Committee for a sharp diversion of affairs into the mainstream of scientific and technical progress. And the reason? All the partners do not have an equal stake in or responsibility for producing new equipment. And again we hear a hint of aloofness -- why us, if this is how things are? E. Kuzin informed the meeting of steps now being taken by the institute. From now on the watchword will be: produce not what we are used to, but what the customer-sectors need. All other operations must be ruthlessly cast off. But why weren't they ruthlessly cast off years ago? "That is our fault," the speaker admitted. And again the aloofness, as if the fault was pardonable, and as if this situation had not developed just at this institute.

G. Krutenko, general director of the All-Union Planning and Technological Institute of Construction and Road Building Machinery Scientific Production Association, informed the meeting of successful designs of hydraulic excavators for the Voronezh, Kentau and Kalinin excavator plants. Introducing them was more difficult -- the pace was chronically dragged out. There were many headaches in redoing the work of the designers and development engineers of the new machines. This delayed the improved models by several years. What kind of models were these? Apparently it was not convenient for the development engineer to produce a good machine right off -- they don't pay bonuses

for development. Bonuses are provided only for improvements and for reducing labor intensiveness. The development engineer knows very well how to make a good machine, but he dispenses his knowledge in bits, for the bonus. And what about engineer's honor? Or the collective morality of the equipment designers? Or of party responsibility? Of these there was no discussion.

Problems of rebuilding are frequently referred to in scientific-production collectives. It is obvious that the ministry's party committee must deal with them immediately. Some difficult questions must be answered. What are the sector's 30 or more scientific institutions doing, and what specific contribution are they making to progress? How is the potential for scientific thought of this large number of development engineers being utilized? Changes must be made in the moral atmosphere in the collectives of scientific units. Someone must take the responsibility for the unsuccessful designs, for the passivity and for the unfinished models. Poor planning alone in the existing pay system cannot explain it all. Questions must be put to the specific people who have permitted this poor planning for many years.

Unfortunately no such strict questioning was heard at the activists' meeting. The critical aspects of the minister's report were uttered with an apology for his "harsh words." Good breeding and courtesy are good qualities in themselves. But for the causes of "the psychological barrier of resistance to the new" and for the causes of the sector's obvious technical backwardness apology was clearly out of order.

I. Gudz, party secretary of the Krasnyy Excavator Production Association, told of much work that has been done by the party committee and the administration on the certification of workplaces. The integrated organizational and technical plan for the 12th Five-Year Plan provides for multiple-machine tending by sharply increasing the number of machines with numerical control and of welding robots and manipulators. But without the specific support of the sector's institutes the association will not succeed in making these changes. Unfortunately, the enterprise's proposals to include re-equipping plans in the institutes' program for 1985 have not been accepted either by the Administration of Capital Construction or by Soyuzstroy Mashavtomatizatsiya /All-Union Association of the Automation of Construction Machinery/. The usual passive "verification" is still going on.

In his speech G. Koshelenko, director of the Heavy Crane Building Production Association imeni January Uprising, said that the production of up-to-date machinery requires the forward-looking organization of production and control. The ministry is not paying attention to this. Starting in December 1984 the association has been unsuccessful in its attempts to include the production and introduction of ASU /automatic control systems/ in the joint plan of the Ministry of Construction, Road and Municipal Machine Building and Minpribor /Ministry of Instrument Making, Automation Equipment, and Control Systems/.

The discussion demonstrated that the sector's party and economic activists have properly assumed long-overdue responsibility for the sector's technical re-equipping. The ministry's management and party committee have a great deal of intensive work to do so that the steps laid out for the future will be carried out without fail. For this it is mainly necessary to create among personnel an atmosphere of intolerance toward passivity and stagnation.

# CONSTRUCTION MACHINERY AND EQUIPMENT

UDC 621.87:69.003:658.011.8

## ANALYSIS OF STRUCTURE OF CRANE FLEET

Moscow MEKHAIZATSIYA STROITELSTVA in Russian No 6, Jun 85 pp 12-13

[Article by S.N. Polyakov, engineer: "An Analysis of the Crane Fleet Structure"]

[Text] With every year, the volume of construction buildings and production equipment assembled is increasing, as is that of loading-unloading operations and vertical conveying.

A variety of load-lifting equipment is used in these operations. Construction cranes are the basic high-volume all-purpose load-lifting machines used in assembly, loading-unloading and vertical conveying operations.

The cranes most widely used in the construction industry are truck-mounted, tower, pneumatic-tire and crawler-mounted models. Series production of cranes mounted on special motor-vehicle-type chassis, and of prototypes of short-wheelbase cranes has been started. Labor productivity, mechanization costs and the time needed to erect buildings and other structures depend on the technical level of these machines and the ratio in the construction machinery park to the capacity of the crane fleet structure.

The cranes now being used in construction and those in production as of 1 January 1984 are characterized by the data given in Table 1:

### Key:

- (1)--Crane designation
  - a--Truck-mounted
  - b--Tower
  - c--Pneumatic-tire
  - d--Crawler-mounted
  - e--Excavator crane
  - f--Cranes mounted on special motor-vehicle-type chassis
- (2)--Number in construction use, %
- (3)--Average load-lifting capacity, t
- (4)--Number of cranes in production, %

(1) Наименование кранов	(2) Количество в строительст- ве, %	(3) Средняя гру- зоподъем- ность в пар- ке, т	(4) Количество выпускаемых кранов, %
a Автомобильные	52,7	8,9	72,5
b Башенные	21,4	7,8	14
c Пневмоколесные	12	19	9
d Гусеничные	13,9	25,6	3
e Краны-экскаваторы	3,5	26	—
f Краны на спецшасси автомобильного типа	0,5	21	1,5



As shown in Table 1, the construction crane fleet consists mainly of two classes of cranes--truck-mounted and tower cranes (52.7 and 21 percent, respectively). The remaining self-propelled boom cranes comprise only a part of the fleet, which does not fully meet the present-day needs of industrial prefabricated construction.

The cranes' single-unit power and average load-lifting capacities also fail to correspond to the increase in the mass-weights of assemblable structures, particularly where large-block and conveyor assembly methods are used.

The need for reduced construction times for prefabricated structures and the scattered nature of the construction industry determine the need to enhance the mobility of the cranes and the proportion of wheeled machines in the fleet.

At present, pneumatic-tire and crawler-mounted cranes comprise the largest portion of boom-type cranes delivered to construction industry projects. Production of these cranes by Minstroydormash [Ministry of Construction, Road and Municipal Machine Building] and Minmontazhspeksstroy [Ministry of Installation and Special Construction Work] plants is still at the 1981 level, and there are no plans for any further increase in the manufacture of these cranes.

At the same time, cranes mounted on special motor-vehicle-type chassis and short-wheelbase cranes are finding widespread use, as they are much more mobile and easier to move from project to project.

An analysis of self-propelled boom crane production for the 1981-1985 period shows that at any given moment 47 percent of the pneumatic-tire cranes, 44 percent of the crawler-mounted cranes, 7 percent of the cranes mounted on special motor-vehicle-type chassis and 2 percent of the short wheelbase cranes in the crane fleet were in use by the construction industry, and the progressive KSh- and KK-model cranes comprised a negligible portion: only 9 percent of all cranes produced.

USSR Minenergo [Ministry of Power and Electrification] and USSR Minmontazhspeksstroy manufacture crawler-mounted cranes for the most part. Minstroydormash has not yet organized production of these cranes.

Deliveries of boom cranes for use in the national economy are characterized according to their load-lifting capacities by the following data.

Table 2.

Key: (1)--Crane designation

a--Pneumatic-tire crane

b--Crawler-mounted crane

c--Cranes mounted on special motor-vehicle-type chassis

(2)--Cranes' load-lifting capacities, in tons

(1) Наименование кранов	(2) Грузоподъемность кранов, т					
	16	25	40	63	100	160
a Пневмоко- леса	53	46	0,5	0,1	0,2	0,2
b Гусеничные	14	74	5	6	0,9	0,1
c Краны на спец- шасси автомо- бильного типа	4	52	36	6	1	1

Structure of Self-propelled Boom Crane Deliveries (%) For Use in the National Economy



As shown in Table 2, the manufacturing structure of boom cranes, with regard to their load-lifting capacities, is one-sided.

Ninety-nine percent of the domestically-produced pneumatic-tire cranes are those of up to 25 tons' lifting capacity, with the figure for crawler-mounted cranes in the same load-lifting range coming to 88 percent. Only 11 percent of these type cranes have lifting capacities in the 40-100-ton and higher ranges. Cranes mounted on special truck-type chassis, with load-lifting capacities of 25 and 40 t comprise 80 percent of the cranes manufactured in this group.

Minstroydormash, the leading ministry for the production of construction equipment, has only four models out of 21 type sizes in series production, seven as prototype models and adjustment series with four crane type sizes in development.

Most of the cranes supplied for the national economy are the pneumatic-tire and crawler-mounted models with load-lifting capacities of 25 and 40 t, and the cranes mounted on special truck-type chassis, with load-lifting capacities of 25 and 40 t. These cranes are used widely in civil and industrial construction projects. At the sites where various facilities are being erected, these cranes help with loading-unloading operations, and combine the assembly of structures with the vertical transport of building materials. When used in on industrial construction projects where the spans for the shop bays are from 6 to 12 m and the distance to the base of the buildings under construction reaches 12 m, cranes with load-lifting capacities of 25 and 40 t are the primary construction machines.

There is presently an increase in the construction of large-scale industrial and power-engineering projects. The spans of the intra-shop bays of these facilities are from 18 to 24 m wide with heights from the base to the rafter trusses of 12 to 18 m and more. Boom cranes, with the tremendous single-unit lifting capacities of 63, 100 and more tons, equipped with a suitable collection of ancillary working equipment are capable of installing columns, girders and especially roof structures. Large-scale manufacturing facilities are presently being erected with the help of domestically-manufactured crawler-mounted and pneumatic-tire cranes with lifting capacities of 63 and 100 t, and also with cranes mounted on special chassis, having the same load-lifting capacity, but manufactured abroad. The growth of prefabricated slab building erection, deliveries of imported production equipment for the petrochemical and oil-refining industry, with improved plant preparation carried out by consolidated centers and the construction of nuclear power stations with oversized elements calls for the use of modular cranes with increased load-lifting capacities. The cranes which are mounted on special truck-type chassis, and which have load-lifting capacities of 100-250 t are such cranes.

An analysis of the manufacture and the utilization of the machine park of self-propelled boom cranes permit the drawing of certain conclusions: the manufacturing structure of boom cranes for the machine-building industry fails to meet fully the present-day requirements of the building industry; the limited

product array and manufacture of crawler-mounted and mobile KSh and KK cranes stems from the predominant production of KP cranes; increased production of cranes with great unit capacity is proceeding slowly, and this fails to provide an intensive increase in the average load-lifting capacity of the cranes found in the machine parks of building organizations.

It bears mentioning that expanding the production of and using new cranes, and modernization of the models which are now in production will replenish the machine park and will aid in predicting its structure in the prescribed direction.

In the "System of Machines Used in the Integrated Mechanization of Construction for the period 1981-1985", which was approved by USSR Gosstroy [State Committee for Construction Affairs] and Minstroydormash in 1981, provision was made for the acquisition of new load-lifting equipment and for a corresponding improvement in the structure of mechanization procedures and of the machine park in 1985 (Table 3):

Key: (1)--Mechanization equipment designation

- a--Self-propelled boom cranes
- b--Tower cranes
- c--Other equipment, including non-crane and hoists

(2)--Structure of mechanization methods

- a--Erection of building structures
- b--Loading-Unloading operations
- c--Vertical transport, %

(1) Наименование средств механизации	(2) Структура способов механизации		
	а монтаж строительных конструкций	б погрузочно-разгрузочные работы	с вертикальный транспорт, %
а Стреловые самоходные краны	58,9	64,3	50
б Башенные краны	34,1	22	40
с Прочие средства, в том числе некрановые, подъемники	7	13,7	10

The structure of the crane fleet will be improved and expanded in compliance with "System of Machines Used in the Integrated Mechanization of Construction"

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## CONSTRUCTION MACHINERY AND EQUIPMENT

### NEW CONSTRUCTION MACHINERY DISPLAYED AT EXPOSITION

Moscow BYULLETEN STROITELNOY TEKHNIKI in Russian No 8, Aug 85 pp 45-48

[Article by L. I. Zelentsova, chief engineer of the Construction and Road Machinery Pavilion: "New Construction and Road Machines"]

[Text] At the VDNKh [USSR Exhibition of Achievements of the National Economy].

The Construction and Road-Machinery Pavilion of the VDNKh SSSR is displaying excavators and operating equipment for them; road machinery; machines for doing pile and drilling work, sinking holes and driving pipes; cranes, pipelayers and working equipment for cranes; loaders, machines for preparing and transporting (delivering) concrete; and powered construction tools. Earth-moving equipment is represented by new models of single-bucket excavators.

On display is the EO-3333 single-bucket hydraulic excavator on a rubber-tired chassis, with telescoping operating equipment for planing slopes and horizontal surfaces, dressing foundation pits, ditches and canals, excavating soil in places difficult of access, and cleaning the beds of rivers and canals. It is distinguished by rational configuration of the units on the rotating platform and a new design for the boom and the bucket-rotating mechanism which reduced weight and increased the boom's reliability. Bucket capacity is 0.63, 0.5 and 0.4 m<sup>3</sup>; excavating radius is 8.4 meters; and depth of excavation is 5 meters. Engine power is 59 kW. Hydraulic-system pressure is 28 (280) MPa (kg-force/cm<sup>2</sup>). Traveling speed is 19 km/hr. The manufacturer is the Kentau Excavator Plant of Minstroydormash [Ministry of Construction, Road and Municipal Machine Building].

The EO-4125 hydraulic single-bucket general-purpose excavator on a crawler chassis, with 30 types of replaceable implements, is designed for excavating quarries and ripping foundation pits and ditches in category I-IV soils and in loosened-up frozen and rocky soils, at ambient air temperatures of -50 degrees C to +50 degrees C. It is distinguished by increased efficiency of the drive and reduced fuel consumption. Bucket capacity (backhoe) is 1.25 m<sup>3</sup>. Excavation depth is 6 meters, excavation radius is 9.4 meters, and the height of discharge is 5 meters. Engine power is 95.6 kW. Hydraulic-system pressure is 28 (280) MPa (kg-force/cm<sup>2</sup>). The manufacturer is the Kovrov Excavator Plant of Minstroydormash.

The EO-5123-2 hydraulic single-bucket excavator on crawler chassis is designed for excavating soils of categories I-IV and rocky and frozen soils

that have been broken up beforehand, at ambient air temperatures of -40 degrees C to +40 degrees C. Its advantages: the crawler tractor-type chassis of increased reliability, longevity and off-the-road capability; reinforced implements; doubled battery power; and an additional set of expanded tracks and grousers. Bucket capacity is 2.5, 1.8 and 1.45 m<sup>3</sup> and excavation depth is 5.4 meters. Engine power is 125 kW. Hydraulic-system pressure is 25 (250) MPa (kg-force/cm<sup>2</sup>). The manufacturer is the Plant imeni Komintern PO [Production Association] of Minstroydormash.

The Odessa Construction-Finishing Machinery Plant of Minstroydormash is manufacturing SP-66A pneumatic hammers for single-bucket excavators--for breaking up firebrick, slag and concrete while repairing metallurgical units and structures. In comparison with the SP-66 hammer it has increased impact energy and reduced air consumption, size and weight. Impact energy is 1,100 J. Compressed-air consumption is 11.2 m<sup>3</sup>/hr and pressure is 0.5 (5) MPa (kg-force/cm<sup>2</sup>).

The EM-251 rail-chassis multiple-bucket transverse quarry excavator is designed for excavating materials from open quarries and clay-storage yards of construction-industry plants. Advantages: increased productivity, the presence of an air conditioner, and the potential for operating in covered storage. Excavation depth is 8 meters and productivity is up to 60 m<sup>3</sup>/hr. The manufacturer is the Dmitrovka Excavator Plant of Minstroydormash.

The two-toothed toolbar ripper on a crawler tractor (T-130 or DET-250) is designed for breaking up hard and frozen soils and old asphalt-concrete road toppings. In comparison with single-toothed rippers, it increases ripping depth by 28 percent and productivity by 16 percent and reduces diesel-fuel consumption by 5 percent. Productivity is 95-171 m<sup>3</sup>/hr, and depth of ripping is 0.5-1.1 meters. It has been introduced at Dneprostroymekhanizatsiya [Dnepropetrovsk Construction-Mechanization Trust] and at Dneproekskavatsiya [Dnepropetrovsk Excavating Trust] of UkSSR Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises]. The manufacturer is the Dnepropetrovsk RMZ [Machinery-Repair Plant] and the Krivoy Rog ERMZ [Excavator Machinery Repair Plant].

The DS-74A rotary road hoe on the wheeled T-158 tractor is designed for ripping and grinding up soil and mixing it with binding materials during the erection of foundations and toppings of highways by the soil-reinforcement method. Depth of ripping is 250 mm, and width of the strip worked is 2,400 meters. Engine power is 121.5 kW. The manufacturer is the Mingechnik Road-Machinery Plant of Minstroydormash.

The DU-57 self-propelled road roller with smooth vibration roller is designed for compacting layers of unconsolidated soils during the fill operation for highway and railroad embankments and the construction of airfield pads, dikes, dams and other earthen structures. It is distinguished by the presence of a hinged-articulated frame and hydraulic lifting drive for the vibrating roller. It weighs 20.5 tons and the compacted strip is 2,400 mm wide. Engine power is 121 kW. The manufacturer is Korosten's road-machinery plant Oktyabrskaya Kuznitsa of Minstroydormash.

The DU-49B 3-roller self-propelled road roller is designed for compacting road bases and toppings. It has a hydraulic-mechanical transmission and an

improved cab. Weight with ballast is 20 tons, the strip compacted is 1,490 mm wide, and engine power is 37 kW. It is manufactured by the Mingeaur Road-Machinery Plant of Minstroydormash.

The DU-54A self-propelled 2-unit vibration roller is designed for compacting asphalt-concrete and small-gravel and soil toppings during the construction and repair of highways and sidewalks. It weighs 2.2 tons, the strip compacted is 875 mm wide, and engine power is 5.9 kW. The manufacturer is Kaliningrad's Stroydormash plant of Minstroydormash.

The VT-3 toolbar soil-compacting equipment for the EO-4121A excavator is designed for compacting layers of soil under crowded conditions and in places difficult of access during construction. For the first time, a flexible element in a ramming plate is installed, and a support strip of special design and a combined suspension are used. Depth of compacting is 0.5-0.8 meter, impact frequency is 13-18 cycles per second, the vibration driver is centrifugal, and the toolbar-equipment weight is 780 kg. It was introduced in SMU-96 [Construction and Installing Administration No 96] of Ukrvodstroy [Ukrainian Water-Resources Construction Trust] and UkrNIIGiM [Ukrainian Scientific-Research Institute for Hydraulic-Engineering Structures and Land Reclamation]. The manufacturer is the Yaroslavl Machinery-Repair Plant of USSR Minstroy [Ministry of Construction].

The DE-3B marking machine, on a self-propelled T-16M chassis, is designed for applying divider strips and indicators on improved surfaces of streets, highways and airfields. In comparison with the DE-3A, it has two implements for applying two marker lines and better reliability of the programming device, and it has been outfitted with a manual marking machine. The width of the line applied is 0.1, 0.15, 0.2 and 0.3 meter. Distance between lines is 0.1 to 3.75 meters, the tanks' paint capacity is 2x165 liters, and engine power is 11.7 kW. The manufacturer is Kaliningrad's Stroydormash plant of Minstroydormash.

The DE-226 auger-and-blower snow remover, mounted on a Ural-4320 truck chassis, was designed for clearing snow from runways, airfields and arterial highways at an air temperature down to -40 degrees C. Productivity is 1,250 tons/hr, the snow is thrown to a distance of up to 37 meters, the layer cleared in one pass is 1.6 meters thick, and width of the strip cleared is 2.81 meters. Engine power: implement drive--294 kW, truck chassis 150 kW. The manufacturer is Minsk's Udarnik plant of Minstroydormash.

Machines for constructing pile foundations (footings), sinking holes and driving pipe deserve attention, as do drilling machines. The SP-78 tubular pile-driving diesel hammer is designed for driving reinforced-concrete piles weighing 3.5-8 tons. It has increased service life, up to 1,200 motor hours. The striker weighs 2,500 kg, and the frequency of blows is 42 per minute. The manufacturer is the Sterlitamak Construction Machinery Plant of Minstroydormash.

The SP-77 tubular pile-driving diesel hammer is designed for driving reinforced-concrete piles weighing 2.5-6.5 tons. It has an increased service life, of up to 1,200 motor hours. Weight of the striker is 2,500 kg, and the potential energy of the striker is 82 (8,200) kJ (kg-force·m). Number of blows per minute is 42. The manufacturer is the Sterlitamak Construction Machinery Plant of Minstroydormash.

The SO-166 machine is designed for driving steel pipe housing into compacted soil by means of compressed air under the ditchfree method of laying underground utility and service lines, and for driving piles during the erection of platforms at offshore oil and gas fields. Diameter of the driven pipe: open end--530 meters, closed end--325 meters. Energy per blow is 1,000 (100) J (kg-force.m). The manufacturer is the Odessa Construction-Finishing Machinery Plant of Minstroydormash.

The SO-134A machine for sinking holes and driving pipe was designed for driving piercing and blind horizontal, sloped and vertical holes and for driving metal pipe into compacted soils under the ditchfree method of laying underground utility and service lines. Diameter of the driven hole: without a reamer 155 mm, with a reamer 245 mm. The manufacturer is the Odessa Construction-Finishing Machinery Plant of Minstroydormash.

The SO-144A machine for sinking holes is designed for driving piercing and blind sloped and vertical holes in compacted soil under the ditchfree method for laying underground utility and service lines. Diameter of the holes sunk: without a reamer 71 mm, with a reamer 100 and 120 mm. Compressed-air pressure is 0.6 (6) MPa (kg-force/cm<sup>2</sup>). The manufacturer is the Odessa Construction-Finishing Machinery Plant of Minstroydormash.

The BM-2001 drilling machine is designed for drilling holes while erecting pile footings in frozen and permafrost soils where there are inclusions of boulders, pebbles and gravel. It is distinguished by a new design for the drive for feeding the drill. Drilling diameter is 0.65-1 meter, drilling depth is up to 20 meters, and drill-feeding speed is up to 3 m/min. The manufacturer is the Krasnoyarsk Branch of MNPO VNIISTroydormash [All-Union Scientific-Research Institute for Construction and Road Machinebuilding] of Minstroydormash.

The NBO toolbar drilling equipment for the EO-2621V excavator is designed for drilling holes for blasting and for sinking piles, for fence posts and supports for communications and power-transmission lines in seasonally frozen soils, and also for planting trees and shrubbery in nonfrozen soils. A two-hinged scheme for the suspension, which permits the drilling of vertical and inclined holes, is used. Drilling depth is 2 meters, drilling diameter is 0.1, 0.35 and 0.5 meter. The manufacturer is the Kiev plant of Krasnyy Excavator PO of Minstroydormash.

A pile-cutter based upon the hydraulic excavator EO-3322A is designed for cutting off reinforced-concrete piles or reinforcement to the prescribed level when erecting pile footings. The frame can be turned in the horizontal plane by 90 degrees in places difficult of access. Its productivity is 80-120 piles per shift. Cross-section of the piles handled is 30x30 and 35x35 cm, and the height of such piles (from ground level) is 4.5 meters. The hydraulic system pressure is 16 (160) MPa (kg-force/cm<sup>2</sup>). The pile cutter weighs 1.2 tons. It was introduced in SMU-9 of Stroymekhanizatsiya Trust of Glavkrasnoyarskstroy [Main Administration for Construction in Krasnoyarskiy Kray]. The manufacturer is Krasnoyarsk Promstroyniiprojekt [All-Union Scientific Research and Design Institute for Industrial Construction] of Mintyazhstroy.

In the crane division, one can become acquainted with boom and tower cranes and pipelayers. The KS-7163 diesel-electric crawler crane is designed for



assembling and erecting consolidated constructional structure and industrial equipment, and also for loading and unloading operations in construction. Individual electric drive of the mechanisms provides for a broad range of speeds. Sections of the boom are erected and extended by means of easily detached joints. A kit of implements expands the areas of use. Load-lifting capacity is 16-63 tons, main hook reach is 5.1-14 meters, lifting height of the hook is 13-61 meters, and engine power is 110 kW. Number of types of interchangeable equipment (or variants) is 23. The manufacturer is the Volgotssemash [Volga Cement machinery] PO of Minstroydormash.

The KS-4572 hydraulic truck crane on a KamAZ-53213 chassis is designed for construction, installing and loading and unloading work at dispersed facilities in housing, industrial and rural construction. Unlike the KS-4571, it has improved load-height characteristics, and is less materials intensive. Load-lifting capacity is 16 tons, boom length is 9.7-21.7 meters, reach is 3.8-17.5 meters. Engine power is 155 kW. The manufacturer is the Galich Excavator Plant of Minstroydormash.

The KS-3575A hydraulic truck crane on a ZIL-133GYa chassis is designed for loading, unloading and construction and installing work. It has improved load characteristics and can operate with a load of up to 3 tons without an extension support. Load-lifting capacity is 10 tons, lifting height of the hook is 16.5-21.5 meters, and boom reach is 2.85-20.6 meters. Engine power is 155 kW. The manufacturer is the Drogobych Truck-Crane Plant of Minstroydormash.

The KB-674A-13 tower crane is designed for mechanization of construction and installing operations during the erection of underground structures, below-grade work and erection of the lower stories of housing, social and industrial buildings of complicated configuration. Innovative elements: the metal structure is made of heat-resistant pipe, the tower is extended upward without re-erection, and there is no erecting pedestal. A reversing thyristor drive for the loading hoist provides for smooth starting and braking. The load-lifting capacity is 7.3-12.5 tons, boom reach is 32-50 meters, lifting height is 17 meters, depth of lowering is 5 meters, and installed electric-motor power is 147 kW. The manufacturer is the Nikopol Cranebuilding Plant imeni V. I. Lenin of Minstroydormash.

The KB-407KhL tower crane is designed for the mechanization of construction and installing work during the erection of housing and administrative buildings up to 12 stories high at an ambient air temperature of -60 degrees to +40 degrees C. The crane has: semiautomatic rail grips, automatic reeving of the cable, and increased speed of the load. The operator's cab is heated. Load-lifting capacity is 6.3-10 tons, lifting height is 41.8-52.4 meters, boom reach is 5.68-25 meters. Electric-motor power is 98.5 kW. The manufacturer is the Ukhta Machinery Plant of Minstroydormash.

The KB-309KhL tower crane is used for erecting housing and industrial and administrative buildings at an ambient air temperature of -60 degrees to +40 degrees C. Metal structure made of low-alloy steel is used in it. The operator's cab is heated. Load-lifting capacity is 5-8 tons, crane reach is 15.6-25 meters and lifting height is 22-37 meters. The electric motor's power is 58.1 kW. The manufacturer is the Ukhta Machinery Plant of Minstroydormash.



The TG-124A crawler pipelinelayer is designed for laying pipelines in ditches, and it is accompanied by cleaning and insulating machines in the column. It is distinguished by an increased moment of stability (the hoist on a counterweight), increased speed of the load, and the presence of a stress alarm. Load-lifting capacity is 12.5 tons, moment of stability is 355 kNm, lifting height of the hook is 5.2 meters, and tractive effort is 17.8 t.c. Engine power is 117.6 kW. The manufacturer is the Baku Machinebuilding Plant imeni Sardarov of Minkhimmash [Ministry of Chemical and Petroleum Machine Building].

The TPK-101 pneumatic-tired pipelayer is designed for laying pipelines in ditches during industrial and nonindustrial construction. It has an original boom design and increased stability. Its load-lifting capability is 10 tons, and its moment of stability is 156.8 kNm. Engine power is 66.2 kW. The manufacturer is the Experimental-Machinery Plant of USSR Minmontazhspetsstroy [Ministry of Installation and Special Construction Work].

The TO-18A wheeled loader is designed for the mechanization of loading and unloading operations with free-flowing bulk and small-lump materials, for earthmoving work on category I-III soils, and for road-construction work. Wide-profile tires with increased off-the-road capability 20.5x25 are used. The cab is protected from overturning and from falling objects. The main bucket's capacity is 1.5 m<sup>3</sup>, the load-lifting capability is 3 tons, height of unloading is 2,725 mm, and engine power is 99 kW. The manufacturer is Minsk's Udarnik plant of Minstroydormash.

The TO-7A single-bucket loader on a DT-75VS-2 crawler tractor is designed for loading, unloading and planing work in construction. Bucket capacity is 1 m<sup>3</sup>, load-lifting capability is 2 tons and power is 59 kW. The manufacturer is the Berdyansk Road-Machinery Plant of Minstroydormash.

Machines for preparing and transporting (delivering) concrete are on display. The SB-135 concrete and mortar mixing unit is designed for preparing concrete mixes and construction mortars at construction facilities. In comparison with the SB-119 and SB-134 units, the SB-135's productivity is 1.5-fold to 2-fold higher, that is, 30 m<sup>3</sup>/hr, size of aggregates is up to 70 mm, capacity of aggregate storage is 100 m<sup>3</sup>, and capacity of the cement storage is 23 m<sup>3</sup>. The rated electric-motor power is 85 kW. It has been introduced at PMK-195 [Mobile Mechanized Column No 195] in the town of Slavyansk. The manufacturer is the Slavyansk Construction-Machinery Plant of Minstroydormash.

The SB-148 mortar and keramzit-concrete mixer is used for preparing construction mortars and keramzit-concrete mixes at ready-mix mortar and prefabricated reinforced-concrete plants. It is distinguished by small metal consumption and dimensions, increased productivity, and good quality of the mixes prepared. Loading volume is 1,200 liters, number of cycles per hour is 30-50 and electric-motor power is 55 kW. It was introduced at the Large Housing-Construction Plant No. 6 and Otdelstroy [Finishing-Construction Trust] (Novosibirsk). The manufacturer is the Novosibirsk Construction-Machinery Plant of Minstroydormash.

The PBS concrete-mix reloader is designed for receiving, remixing and delivering concrete mix with a slump cone of 6-15 cm in the receiving hopper of

a ready-mix pump truck at an ambient air temperature of -8 degrees C to +40 degrees C. Productivity is 5-40 m<sup>3</sup>/hr, height of loading and unloading of the receiving hopper is 0.85 and 1.6 meters, and drum capacity is 7.5 m<sup>3</sup>. It has been introduced at Vladimirpromstroy [Vladimir Industrial Construction Trust]. The manufacturer is the Stroymekhanizatsiya Experimental Plant of USSR Minstroy.

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LAG TIMES FOR NEW MATERIALS PRODUCTION TECHNOLOGY DISCUSSED

Moscow IZVESTIYA in Russian 13 Sep 85 p 2

Article by V. Buldashov: "Time for New Technologies"

Text In all probability, the attention of many has been drawn to the lines in the report by the USSR TsSU Central Statistical Administration: over a 6-month period, less cement was produced than the figure actually planned. One would agree that it is unusual to read about this. More cement is produced in our country than in any other country. It was this way in the past and it continues to be this way. Nevertheless, the task for labor productivity has not been fulfilled for the construction materials industry as a whole.

Was this just a random happening? Could it be the result of the past stern winter? It certainly added difficulties. However, the principal problems were not associated with the winter. There were other factors which played a role -- how well did the branch prosper from scientific-technical progress and to what degree are the new items of equipment and technologies being introduced into operations in a persistent and consistent manner?

This was the subject of a joint meeting of the committees for construction and the construction materials industry of the union soviet and the Soviet of Nationalities of the USSR Supreme Soviet.

Permit me to add a few words concerning the branch. It includes hundreds of thousands of workers. Its structure numbers two dozen independent "branches" -- brick, cement, glass, sanitary engineering... The majority of the production efforts are fuel and material-intensive. The variety of the products is extremely broad -- from hardware to precast reinforced concrete. The following figures are rather expressive: the ministry's enterprises produce all of the window-glass, 93 percent of the overall volume of cement being produced in the country, 95 percent of the slate and soft roofing materials, 75 percent of the ceramic tiles and more than 50 percent of the brick and other wall materials.

If you please, even this very brief "visiting card" of the branch can provide one with an appreciation of the specific nature of the branch and its role and place in our economy. The support for construction projects and exactly what items can be purchased in a construction materials store by a private builder are dependent upon the work of the branch.

The requirements are still not being satisfied fully, especially with regard to finishing, covering, thermal-insulating and roofing materials. The process involving a noticeable aging of the fixed capital is taking place throughout the branch. Up until recently, even the ministry's plans did not call for the use on a large scale of progressive equipment or technologies or modern means of automation. In many instances, the new developments of the branch institutes were employed only at one or two enterprises.

However, after devoting some attention to the complaints being made against other departments, the speaker -- 1st deputy minister of the USSR Construction Materials Industry N. Kabanov -- casually discussed the reasons for this situation throughout the branch. Too much reliance is being placed upon "what will be." There is still too much window dressing in the speeches! However, the tempting prospects did not lull the deputies to sleep. They directed many questions at the speaker in the interest of ascertaining and defining more precisely exactly what is being done to overcome the lag that has developed.

In the co-report of the leader of the deputy preparatory committee, the 1st secretary of the Karaganda Oblast Committee of the Communist Party of Kazakhstan A. Korkin and in the speeches by the deputies, proper credit was given to the positive developments that have taken place throughout the branch. At the same time, all were unanimous in their overall evaluation: the work being carried out by the ministry in connection with accelerating scientific-technical progress is not in keeping with the modern requirements.

The branch is in heavy debt to the state in terms of the quantity and quality of the products being produced. The proportion of new and efficient materials and products remains at a low level -- approximately 10 percent. Resource and energy-conserving technologies are being introduced into operations very slowly. The technical re-equipping of the branch is being carried out in a sluggish and incomplete manner. More often than not, it amounts to nothing more than a simple replacement of worn out equipment. Here the automatic lines continue to be only individual areas of activity.

Deputy A. Sukhanov, a brigade leader for drift miners of the Moscoe Metrostroy /organization concerned with the building of underground subways/, in response to a committee assignment, acquainted himself with the status of affairs at the Voskresensk Krasnyy Stroitel Asbestos Cement Combine.

"The collective of this enterprise" he stated, "has mastered the production of extrusion panels. The products are very good. It is unfortunate that the production operations are carried out in a feverish manner: over a period of 4 years, it has fallen behind in its deliveries by more than one and a half million square meters. The technological lines are not being operated at full capability. Some of the sectors, as the saying goes, have not been completed. There is a rather large amount of manual labor."

Alas, it was also noted during the meeting that these incidents are not singular in nature. Within the branch there are many enterprises where robots and sledge-hammers co-exist peacefully.

Deputy T. Makarova, a painter for the Tulgorstroy Administration, stated with some uneasiness that only an extremely small amount of finishing work is

presently being carried out in construction using industrial methods: there is a shortage of the required materials. Meanwhile, at the Leningrad Polimerstroyaterial Plant, where linoleum production is being carried out using the latest equipment, only 23 percent of the available capability is being utilized. Large quantities of equipment have accumulated at the ministry's storehouses, including imported equipment. Nobody seems to know exactly when it will be installed.

Definite links exist in a molecule between its atoms. When they are stable, the molecule "lives" and it possesses all of the properties of the particular substance. Nothing of the sort occurs in the "cells" of an economy. Minstroyaterial /Ministry of the Construction Materials Industry/ has permanent partners, particularly Minstroydormash /Ministry of Construction, Road and Municipal Machine Building/ and the construction ministries. Derelictions in one branch have an immediate effect on other branches.

During the years of the present five-year plan, not one of the construction materials fulfilled its plans for contractual work for Minstroyaterialov. The construction schedules for its projects exceeded the norms by a factor of three or more. In short, the builders were in no hurry to complete their work. But, as the saying goes, the Ministry of the Construction Materials Industry was also not without sin: the capital investments are being distributed among numerous projects and are not being concentrated on projects which are already underway.

There is still another example. New equipment for the production of brick must be supplied by the Khmel'nitskiy plant of Minstroydormash. The enterprise has already been under construction for several years and only 9 million rubles of 54 million allocated have been utilized. In view of these rates, the question is being asked as to exactly when it will be placed in operation.

Flaws in the carrying out of planning work are also having an effect. Up until recently, the branch used one third of the capital investments allocated to it for the modernization and technical re-equipping of enterprises. Only now the situation is changing: the plans now call for this proportion to be increased to one half.

However, quite often the branch itself is guilty of allowing these derelictions to occur. And particularly its staff -- the ministry. Its operational style was criticized sharply by Deputy P. Fedirko, the 1st secretary of the Krasnoyarsk Kray CPSU Committee. No efficient or strict control is being exercised over the carrying out of the decisions handed down by the board and, as a result, many of them remain only on paper. Sluggishness, weak knowledge of the situations out in the various areas and a lack of responsibility for administrative decisions handed down -- according to the deputy, these faults are typical of a considerable number of the ministry's staff workers.

The branch's tasks with regard to scientific and engineering development are not being carried out. The measures planned for special purpose all-round programs are not being carried out in a satisfactory manner. Of 22 tasks, only 14 were carried out during the first six months. It can be said that the ministry still does not attach sufficient value to the role being played by science in the development of the branch. And yet there are more than 13,000

scientific workers attached to the scientific-research organizations of Minstroyaterialov. They have produced many promising works. But many of the branch institutes are still far from solving the chief problems. It is almost as though their task is not to advance scientific-technical progress, but rather to justify in one way or another the existing state of affairs in the branch.

"For more efficient interaction between the institutes and industrial enterprises, they should be combined into NPO's /scientific production associations/" such was the proposal by Deputy L. Petravichyus, director of the Akmyane Akmyantsementas Cement-Slate Production Association imeni 50-Letiya SSSR.

It is believed that this proposal will be studied carefully by the ministry.

The scientific developments and their introduction into the branch are often dragged out over a number of years. Nilkeramzit has been creating a technological line for the production of ceramic sand over a period in excess of 10 years. The conversion over to the production of cement using the dry method was dragged out for almost 20 years: throughout this entire period, a search was carried out for an "optimum technology." And today we are still encountering the problem of finding basically new and more economical methods for obtaining cement.

An innovation should be introduced into operations without having to wait until it paves its own way. Here it is impossible to proceed in the absence of initiative and enterprise. And here is what happens when these factors are lacking. Several years ago, the Yerevan Institute of Stones and Silicates proposed the use of several scientific developments for the production of perlite-fiber panels. There was immediate interest, but in another branch. Minlesbumprom /Ministry of the Timber, Pulp and Paper and Wood Processing Industry/ built a plant where this thermal-insulating material is being produced based upon the use of perlite and waste paper. The construction of still another department was started. And Minstroyaterialov had not even started to plan for such production.

There is also a progressive technology in glass production. However, it has been introduced only at the Saratov Plant for Technical Glass. The present innovation may become obsolete while other enterprises are still awaiting their turn to be supplied with it.

Within the branch, only weak use is being made of the experience of leading collectives. For example, let us take this same Akmyantsementas Association. At this facility, an automatic system for controlling technological processes was introduced into operations and progressive technologies for the production of asbestos cement sheets and pipe were mastered. And a large number of inventions and rationalization proposals were introduced here! As a result, the operators of rotary furnaces achieved the highest indicators in the branch. If the same furnace productivity was achieved at all of the cement plants, more than 4 million additional tons of cement would be produced. And there are many such reserves available. The deputies placed emphasis on the fact that leading experience must be disseminated in a more energetic manner. In addition to publicizing it, it must also be introduced into operations.

The opinion of the permanent committees, regarding the methods to be used for solving the tasks confronting the branch, has been set forth by them in recommendations for the USSR Ministry of the Construction Materials Industry. Appropriate recommendations have also been made to other departments. In particular, recommendations concerned with equipment deliveries and accelerating the construction of the branch's installations.

Deputy control was established over the recommendations adopted.

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CONSTRUCTION MACHINERY AND EQUIPMENT

RED TAPE DELAYS INTRODUCTION OF NEW CONSTRUCTION TECHNOLOGY

Moscow SOVETSKAYA ROSSIYA in Russian 13 Aug 85 p 2

[Article by M. Malakhiyev, Krasnoyarsk, under the rubric "The Economy--Reserves of Thrift": "Ministerial Obstruction"]

[Text] No one subunit of Glavkrasnoyarskstroy [Main Administration for Construction in Krasnoyarsk] attracts such attention of specialists as the Experimental Plant Construction Combine. A fundamentally new technology of industrial construction from light metal structures delivered as complete units has been developed here. What does this provide?

A year ago, for example, one could see the following picture at a site where a heavy excavator plant was being built. Packaged parts and components would be brought in in the morning. Installers would assemble them and rig them with the necessary equipment. By evening some of the enormous prefabricated panels already were standing in place. Specialists estimated that construction times of projects under the new method were reduced threefold and labor inputs were cut by more than half. The use of light structures permits saving hundreds of tons of cement and metal and eliminates "wet" labor processes in finishing.

V. Abovskiy, director of the Krasnoyarsk Promstroyniproyekt [exact expansion unknown], proves with figures in hand the effectiveness of the new construction method. A square meter of brick dividing wall weighs 580 kg, while a square meter of a metal dividing wall produced at the plant construction combine is almost 25 times lighter. Or take the following feature. One reinforced concrete panel made at Norilsk costs around 100 rubles and a Krasnoyarsk panel delivered to the Far North is almost half the cost. It is therefore no accident that USSR Gosstroy decided to disseminate this experience and strengthen the combine's production base. The idea also found support in USSR Gosplan. Minttyahstroy [Ministry of Construction of Heavy Industry Enterprises] was told to take steps to increase the capacities of the Experimental Plant Construction Combine. "The transition to installation of buildings and facilities of light metal structures is the most efficient way to cut overall labor expenditures and for a practically total elimination of finishing work at the construction site," emphasized Gosplan specialists. There is no question that it is not often that the work of an individual enterprise, let alone one that is not the largest, becomes the object of attention of the country's main planning body. But this is a special instance.

The specialists saw an expedient kernel which can produce an excellent "harvest" throughout the construction sector. For this reason the Glavkrasnoyarskstroy was told to strengthen the enterprise's production base and spread its experience in other construction ministries. It was planned to set up a shop at the Chernogorsk Plant of the Experimental Plant Construction Combine for putting out structures of efficient sections.

It appeared that things went well at first. The combine's administrators drew up a detailed plan for developing the enterprise and submitted it to Glavkrasnoyarskstroy. There was confidence that the initiative would be supported in the main administration and that the program outlined after discussion in Gosplan would be carried out with the help of the Ministry of Construction of Heavy Industry Enterprises. This would permit a considerable expansion in the combine's capacities and assure development of the unsettled areas of Krasnoyarsk Kray. It is planned to set up several new major power engineering, timber processing, and machinebuilding enterprises. The very scale of the kray's development demands a rejection of the traditional method and a shift to more progressive forms for organizing the construction flow. But it was learned subsequently that Glavkrasnoyarskstroy was not even trying to implement the planned program. The measures submitted for approval to A. Rudakov, chief engineer of the main administration, lay almost 1½ years on Aleksandr Mikhaylovich's desk without any movement. He didn't even have an inkling what problems would have to be solved and with what proposals he had to go to the ministry. His position is extremely simple:

"The combine is our shop and we ourselves know how to handle it and how it is to develop."

These words also were backed up by action. In 1984 the main administration gave instructions to reduce the number of the combine's engineering-technical workers by two-thirds although Gosplan, to the contrary, recommended that a design bureau of 30 persons be set up here. It was decided to transfer one of the combine's subunits, the Abakan shop of the Chernogorsk Experimental Plant, to another organization. The combine in essence was almost eliminated as an independent economic unit. As strange as it may seem, the Glavkrasnoyarskstroy technical manager showed the greatest activeness here. He has a special approach to the innovation.

"No more than 30,000 m<sup>2</sup> a year of light structures are needed for our main administration," asserts Rudakov. "No more is necessary, and so there is no need to increase output."

It turned out that Rudakov also took this figure out of thin air, as the saying goes. This very year the builders of Glavkrasnoyarskstroy are using some 50,000 m<sup>2</sup> of light structures, and the need for them is constantly growing.

The opinion of O. Shenin, secretary of the party's Krasnoyarsk kraykom, is that "the volume of construction and installation work in the main administration will double in the next few years. Many power engineering and timber processing projects will be built in remote areas difficult of access where there are not even any roads. There is one solution: to make wider use of light structures and improve construction technology."

The combine's collective proved the advantages of the new method of building projects in action. The yearly output per worker reached R28,000—a little over three times more than the average for the main administration! But even this record productivity remained unnoticed, although the heads of Promstroy-niiprojekt and of the combine informed the USSR Ministry of Construction of Heavy Industry Enterprises about all obvious advantages of the new method of construction. They set forth in a detailed memorandum how to increase the technical level of building installation faster and gain an improvement in the sector's work. It was proposed, for example, to join planners, plants and installation administrations in a single organization. Minister N. Goldin placed a resolution on the memorandum from Krasnoyarsk: "Prepare for board consideration in the first decade of February 1984." This instruction has not been carried out to date.

The question arises: Isn't it the inertness of ministry heads which has become the main obstruction in the path of dissemination of the new technology? It is worthy of regret that neither Gosplan nor USSR Gosstroy concerned themselves with assuring precise control over how previously made decisions were being implemented. One only has to visit plants of the Ministry of Construction of Heavy Industry Enterprises in Pervouralsk, Chernogorsk, Pavlodar or Novokuznetsk to see how many unresolved problems there are there. One enterprise doesn't have enough specialists, imported equipment is standing idle at another, and at a third the construction of a shop or production section has been long drawn out. Nevertheless, even now the plants could adjust the output of complete sets of structures and supply 1.7 million square meters of such materials per year for the country's new construction sites.

There are enormous reserves in the hands of builders themselves. Light safety structures will permit saving at least 30 percent of the metal. But the trouble is that many construction organizations of the ministry in charge of the plants are not ready or are unable to use the new parts, and so they reject them. The planning institutes of USSR Gosstroy also take a strange position. They continue to be in no hurry to include progressive metal structures in the plans and are disinterested in implementing the labor-saving policy, under the flag of which the Siberian economy must develop.

The habit of working in the old way proved to be unbelievably strong. How can we not recall Glavkrasnoyarskstroy, for which the technical and economic indicators have been worsening from year to year? The collective has not fulfilled the plan for two five-year plans in a row now. Labor productivity and construction quality is dropping and the personnel turnover is growing. Life itself suggested a way out of the dead end to the main administration heads but, as we see, they are scorning even their own experience. The frequent replacement of the first heads of the main administration and technical administration unquestionably hampered the development of the good work to some extent, but this did not give the leading specialists and the party organization the right to be outside observers. The fact is that the workers of USSR Minstroy [Ministry of Construction] and USSR Minvostokstroy [Ministry of Construction in the Far East and Transbaikalian Regions] took quite a different attitude toward the experience of Krasnoyarsk personnel. On learning of the innovation, the heads of these ministries placed specialists on detached duty to study the foremost construction methods, to adopt them as quickly as possible and to reorganize their own production units accordingly.

"The Krasnoyarsk Experimental Plant Construction Combine showed us an excellent example of a contemporary method for building industrial projects," says V. Chernoiivanenko, chief of the technical administration of Glavkuzbasstroy [Main Administration for Construction in Kuzbass].

It is as if the heads of the Ministry of Construction of Heavy Industry Enterprises and the Krasnoyarsk main administration do not even notice the valuable experience in their very own business, experience which continues to promise an enormous benefit both for the Siberian builders and for the entire sector.

6904

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OUTPUT DATA FOR BASIC CONSTRUCTION MATERIALS IN UKRAINE

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 5, May 85 pp 44-46

[Article by A. Shevchenko, UkSSR minister of the Construction Materials Industry: "On the Economy of Resources in the UkSSR Ministry of Construction Materials System"]

[Text] The main direction in the development of the sector is the completion in a worthy manner of the 11th Five-Year Plan period and the acceleration of production in the construction materials industry of the republic.

At the start of the five-year plan period, by virtue of a number of reasons, the rates of its development were lower than planned. Having evaluated the situation realistically, engineering and technical workers, together with staff workers in industrial scientific research establishments, developed efficient measures, directed toward overcoming negative trends, especially, in the question of improving the utilization of fuel-power raw materials and other material resources in the sector.

Nineteen hundred eighty-four marked by positive improvements in conserving resources of construction materials of the industry at enterprises of all subsections in the UkSSR. As compared to 1980 as a result of reducing unit norms for consuming fuel-power resources, the sector saved 163,500 tons of boiler-furnace fuel (in terms of standard fuel) (or 1.9 percent); 10.6 millions of kw-hours of electrical power (or 1.55 percent); 355,200 gigacalories of thermal energy (or 5.7 percent). As compared to 1983, its enterprises saved 1,900 tons of rolled ferrous metal stock; 3,700 tons of cement; 2,600 tons of asbestos; 2,900 tons of sodium sulfide and many other materials.

A number of measures was implemented by the enterprises of the sector on introducing no waste or low waste technologies in production, efficient construction materials and products, power-saving machines and equipment, and scientifically substantiated norms for the consumption of raw and other materials, fuel and energy. Thus a technology was introduced for producing cement by the dry method on a new line with a reactor-decarbonizer at the Krivoy Rog Cement-Mining Combine; a technology for producing ceramic products on high productivity flow-conveyor lines at the Slavyansk Ceramics Combine, the Lvov Ceramics Plant and the Kharkov Tile Plant; a technology for producing polished sheet thick glass on a line for two-stage glass formation at the Konstantin "Avtosteklo" Plant, etc.

We will take, for example, the ceramics industry. The average annual increase in its output reached 5.9 million rubles, while the fuel consumption for the production of ceramic tiles was reduced by 9.7 percent in four years of the five-year plan period.

In 1984, 3,066,300 tons of cement were produced by the progressive dry method which saved over 30,000 tons of standard fuel.

Saving fuel-energy and raw material resources at the sector's enterprises was achieved by expanding the use of secondary resources and industrial wastes in the production of structural materials. Thus, in 1984, 822,200 tons of wastes from enriching coal and coal mining were used. Some 2,647.12 million pieces of standard ceramic brick (for a sum of 136.4 million rubles) and 440.71 million pieces of small wall blocks (for a sum of 17.2 million rubles) were produced, and 6,570 tons of standard fuel were saved.

Some 424,700 tons of TES [Thermal Electric Power Plant] ashes and slags were reprocessed in the sector to produce 16 million tons of cement.

Some 8.965 tons of commercial roofing paper using secondary textile materials (rags) (total cost of 291,300 rubles) were manufactured.

Broken glass is used widely in the production of glass products. In 1984 alone, over 2,100 million pieces of glass containers and bottles were made using broken glass, saving thereby over 30,000 tons of soda ash.

Much has been done, but we also see omissions that prevent going further and achieving more. A number of the sector's enterprises do not use available reserves fully and carry out works without proper persistence in introducing the latest equipment and technology into production, strengthening the mode of saving, and do not use secondary resources and industrial wastes widely enough.

Plans and goals for 1985 which must be implemented by the collectives of the construction materials industry are very intense. An increase in production rates in the sector are set higher. Moreover, this increase in production must be provided with less unit consumption of material resources than last year, especially of fuel, metal, cement, sodium carbonate and other important resources.

To implement these tasks, it is necessary to strengthen those positive tendencies which were planned for the development of the economy in the sector, to be more decisive and carry out firmly the course on the intensification of production of construction materials and increase the output of highly efficient materials. Greater demands must be made on cadres of all ranges, and their responsibility for the state of affairs in the sector must be increased.

Each labor collective in the construction materials industry in the republic and the ministry as a whole posed for themselves the following problem: to work 2 days in 1985 using the saved fuel-energy resources, metal, cement, gasoline, diesel fuel, petroleum-bitumen and raw and other materials. A plan of organizational-technical measures was developed and approved which should provide for the implementation of socialist obligations undertaken by the sector's workers to save 44,600 tons of standard fuel, 24.68 millions kw-hours of electrical power, 33,000 gigacalories of heat energy, 900 tons of rolled ferrous metals stock, 9.800 tons of cement, 1,300 tons of asbestos, 1,800 tons of petroleum-bitumen and 577 tons of petroleum products.

The basis of these socialist obligations is a reduction in the schedule for introducing achievements of science and technology into production, an improvement in the quality of construction materials, a reduction of various kinds of losses, a reduction in material consumption in the manufactured product, an expanded use of secondary resources and industrial wastes in the sector, an increase in the scale of introduction of advanced technologies, and a renovation of product assortment.

In brigades and work positions, this work is fortified by the introduction of personal savings accounts. Some 1016 savings accounts of which 540 are collective accounts were opened in the sector. This movement is supported by 13,400 workers. In 1984, 268,200 rubles in bonuses were paid in the sector.

Labor collectives of the Ministry of the Construction materials Industry of the UkSSR adopted wide socialist obligation under the slogan "To each working hour--the highest output." Workers in the sector are an example of conscientiousness and search actively for reserves to increase labor productivity, the quality of work and to save material resources.

About 59 percent of all industrial-production personnel of the sector participate in the public inspection which is held at construction materials enterprises under the slogan "Economics must be economic." Of the 6916 proposals made, 5939 were utilized. The assumed annual saving from them is over 7.8 million rubles.

With each day the socialist competition of labor collectives in the construction materials industry becomes more intensive for a worthy reception for the important dates of this year -- the year of active preparation for the 27 party congress.

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USE OF MORE CLAYDITE, OTHER FILLERS URGED FOR CONCRETE PRODUCTION

Moscow BETON I ZHELEZOBETON in Russian No 7, Jul 8 p2

[Article: "Develop Production of Light Concrete for Structures"]

[Text] The development of the production and use of light structural concrete is one of the large reserves for intensifying construction, reducing its material consumption, cost and labor intensity. Our country leads the world in the use of light concrete in construction. In 1985 the output of light concrete structures will exceed 25 million m<sup>3</sup>. The increase in the production of light concrete was due to the wide possibility of reducing the weight of the erected buildings and structures and the wider utilization of byproducts extracted in raw materials, and the utilization of industrial and agricultural wastes. All this facilitates the improvement of the environment, a reduction in fuel and power consumption in the area of constructing and operating buildings, free transportation facilities and a reduction in the volume of transportation. In the final account, this leads to a reduction in the consumption of materials and construction costs which is one of the most important problems in capital construction, following the basic directions for economic and social development of the USSR for 1981-1985 and the period of up to 1990, adopted by the 26th party congress and made more precise in the decrees of the following plenums of the Central Committee of the CPSU.

By using various kinds of porous fillers and utilizing modern technological approaches, it is possible to produce light concrete for the most varied purposes.

Due to the work of Soviet scientists, light concrete has acquired a number of qualitatively new properties. This made it possible to expand the area of their application considerably during the time that has passed since the Second All-Union Conference on light concrete (1975, Minsk).

During the past five years, a complex of norm documents necessary for the mass production of light concrete structures for various purposes, was approved and issued. This is GOST 25820-83 which determines the requirements of light concrete, concrete mixtures and fillers. A standard was reviewed for porous inorganic fillers for light concrete (GOST 9757-83), as well as series of standards for individual types of porous fillers (keramzit, agloporit, shungizit, swollen perlite), in which requirements of the quality of porous fillers for light concrete were raised. For the first time, standards were

developed for flue dust, ashes and ash-cinder mixtures of thermal electrical power plants. These standards state the requirements as fillers for light concrete of prefabricated or monolithic concrete and reinforced concrete structures for buildings. Construction norms and regulations were reviewed for designing concrete and reinforced concrete structures, with typical norms for cement consumption in light cement structures. A "Manual for plant technology for manufacturing panels for outer walls from light concrete using porous fillers" was developed, which formulates the basic regulations of plant technology for structural heat-insulating light concrete, and a number of other norm documents.

A great deal of work was done in the area of introducing light concrete structures in mass construction. The volume of production of porous fillers and light concrete using them increased by 25 percent. In 1985 it is expected to produce 44.5 million m<sup>3</sup> porous fillers, i.e., the increase in the current five-year plan period will be about 6 million m<sup>3</sup>, or 15.5 percent.

The basic increase was obtained by increasing the volume of output of keramzit and the production of puffed up perlite. Regrettably, the output of the remaining porous fillers practically did not change. In the European part of the country where there are no natural dense fillers for construction cement, a promising raw material is the widely distributed silicon rocks (tripolite, diatomite, opoka). An example of efficient fillers of silicon rock is tripolite gravel, used in recent years in the Orlovsk and Vladimirk oblasts. In northwestern parts of the European parts of the USSR practical production experience was accumulated in using products and structures made of shungizit concrete for which the fillers were produced by roasting karelian shungite rock.

Interesting work with a new efficient kind of artificial porous filler (azerit) is being done in Azerbaidzhan. On its basis, experimental lots of light concrete were obtained with a strength of 5 to 50 megaPa and densities of 700 to 1500 kg/m<sup>3</sup>.

New efficient enlarged structures were developed and introduced in mass production, including highly prefabricated structures of light concrete with improved operating characteristics: complicated cover plates, panels for building spans with heaters, 12-meter hollow decking, enlarged panels for walls of industrial, public and agricultural buildings with window openings, etc.

The comprehensive use of light concrete structures in large-panel and module construction quadrupled. Mass production of multistory houses using light concrete in seismic regions was organized.

Along with this, there are serious shortcomings in the production and use of porous fillers for light concrete which reduce the efficiency of their utilization. The quality of keramzit, which is the basic kinds of porous filler, and the technical-economic indicators of its production remain low. The poured density of keramzit practically does not decrease, while the output of the most efficient keramzit gravel of the 300-400 brands does not exceed

10 percent. The average fuel consumption for keramzit production is being reduced at an insufficient rate and exceeds 1.5 to 2 times that achieved at leading enterprises and abroad. The industrial output of porous sands is not great enough in volume. Thermal electrical power plant [TES] ashes and wastes of coal enrichment in manufacturing artificial porous fillers are not utilized sufficiently. The production of less power-consuming porous fillers, natural and slag pumice, is being developed too slowly.

The average density and thermal protection properties of light concrete used for buildings in many regions of the country do not meet modern higher demands. Possibilities for improving the quality and efficiency of light concrete by using TES ashes, additives, proper preparation methods, transportation, preparation of the light concrete mixture are not being utilized efficiently. The necessary development of efficient bearing structures from light concrete in housing and industrial construction is not being done.

Thus, to increase production efficiency and the use of light concrete, it is necessary to solve a great volume of various technical and organizational problems. The duty of scientists, designers and production workers is to find ways to solve problems of the further development of the production and use of such concrete in mass construction. This problem will be solved at the 3d All-Union Conference on Light Concrete which is planned in August of the current year in Yerevan.

The accumulated experience in the production and use of concrete and concrete structures, and the results of new developments are reflected in a series of articles, organized by the editor for the purpose of showing the prospects of increasing the output of such structures and the possibilities for expanding the areas of their application.

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## CONSTRUCTION MACHINERY AND EQUIPMENT

### CAPACITY, PRODUCT LINE OF NOVOKRAMATORSK MACHINEBUILDER

Moscow VNESHNYAYA TORGOVLYA in Russian No 1, Jan 85 pp 19-23

[Article by V. Aleksandrov, chief Association engineer: "The Novokramatorsk Machinebuilding Plant Production Association: A Word to the Production Associations" 7]

[Text] In September 1984, the Novokramatorsk Order of Lenin, Order of Labor Red Banner and Order of the October Revolution Machine-Building Plant imeni V. I. Lenin celebrated its 50th anniversary. In recognition of the association's contribution in providing heavy industry with progressive equipment, it has been awarded the Order of People's Friendship.

The NKMZ [Novokramatorsk Machine-Building Plant] is one of the largest Soviet heavy-machine-building enterprises, and specializes in the manufacture of technically unique equipment for the metallurgical, coal and mining sectors of industry as well as power-production, ship building and motor vehicle and tractor building equipment.

The growth in production volumes and the technical progress in these sectors has been determined in large part by the rolling mills, stationary and mobile mixers, wheel and walking excavators, crusher-grinders and large-scale forging and pressing machines which the association manufactures. Over 70 percent of the hot-rolled sheet steel manufactured in this country, 50 percent of the strip-mining done at open pit mines and 60 percent of the ores stamped during enrichment show the scale of production carried out in the USSR, and this is only a part of the output made possible through the use of our association's equipment. You can find equipment with the NKMZ trademark in a number of domestic industrial sectors. This equipment is exported to 28 countries as well.

One of the principle products manufactured for export by the association is rolling equipment, specifically rolling mills used to manufacture sheet metal.

NKMZ supplies hot-rolling plate mills, hot- and cold-rolling mills for aluminum alloy plates and bars, and cylinders for blooming and sheet mills.

The association usually manufactures complete rolling mills for which an entire complex of developments have been carried out, and manufactures machinery as well. Specialized organizations and enterprises are brought in as needed in the development and manufacture of special stock parts.

In a number of cases the association has supplied customers with individual machines, rolling mill rolls and spare assemblies.

The experienced work force which the association has at its disposal, as well as the up-to-date production base and the close connections it maintains with the country's scientific institutes permit NKMZ to develop its rolling mills at whatever level required at present.

Widespread utilization of the latest scientific and technical achievements in the field of domestic and foreign machine-building, and the constant study of the operation of working rolling mills comprises the basis upon which the rolling mills manufactured by the association are being perfected, their operational characteristics are being improved, and their quality, reliability and service life are being improved and lengthened.

NKMZ-designed rolling mills are recognized as highly-productive and operationally reliable units.

Since 1950, 39 rolling mills have been manufactured for export, including six blooming and slabbing mills, three plate mills, 10 continuous and semi-continuous hot-roll wide-range strip mills and 16 mills for rolling aluminum and other non-ferrous metals.

Our main customers are the fraternal socialist countries which order a major part of the rolling mill equipment which we export.

You can find rolling mills with the NKMZ trademark running well in metallurgical plants in Poland, Czechoslovakia, Hungary, Romania, Bulgaria and the Democratic People's Republic of Korea. Many of them have exceeded their projected productivity levels. Some of the rolling mills which were manufactured 15-20 years ago have now been modernized, and this has brought about a great improvement in their technical features and they are being increasingly equipped with state-of-the-art automation equipment, which consequently increases the rolling mills' productivity and improves the quality of the products they manufacture. NKMZ usually handles the modernization work on the mills.

In recent years, enterprises of SEV [Council of Mutual Economic Assistance] member countries have witnessed the development of mutual cooperation in the construction of large-scale rolling mill complexes. Specifically, NKMZ has been taking part in the manufacture of the wide-range strip mill equipment supplied to Czechoslovakia for the Azovstal Works. The equipment for the model "3600" rolling-mill which was constructed within the Metallurgical Combine imeni B. Berut, located in the Polish People's Republic, was designed and manufactured by NKMZ in collaboration with PPR organizations and enterprises. There are quite a number of similar examples.

The collaboration and cooperation of enterprises in socialist countries in the construction of large-scale rolling-mill shops is raising the technical level of the new rolling mills, and is accelerating their development.

A major portion of the products manufactured by NKMZ for export is made up of rolling-mill equipment for the Indian market. There are a model 1250 slabbing mill and a model 2000 continuous wide-range hot-rolling mill, both of which are operating with success in a metallurgical plant in the city of Bokaro. Deliveries of equipment for the model 3600 wide-range rolling mill, for the Bkhilayskiy Metallurgical Plant, have been completed. It is worthy of note that a considerable portion of the equipment for this unique rolling mill is manufactured by the Indian Machine-Building Plant in Ranchi, and is built according to a design and with the assistance of the Soviet Union.

The rolling mill equipment manufactured by NKMZ is exported to 14 of the world's countries. This includes large deliveries of this equipment to Turkey, Pakistan and Egypt.

The association carries out unceasing efforts to devise new types of rolling-mill equipment which will be improved and more efficient. In this connection, a great deal of emphasis is placed on increasing its competitiveness in the foreign market.

A new generation of rolling mills is being developed in collaboration with scientific research and planning organizations: the model 3600 and 5000 plate mills, the model 1700, 2000 and 2500 wide-range hot-rolling mills and the model 2000 cold-rolling mill for aluminum alloys.

The new rolling mills are characterized by their high level of mechanization and automation, and by the quality of their rolled metal products and their productivity.

For foreign customers, NKMZ has come up with rolling mills, the design of which takes the specific customers' conditions into account, as well as the best way to use the equipment with regard to its makeup and parameters. NKMZ has also been proposing skilled assistance in determining the most efficient periodicity with regard to the construction, installation and production start-up of the equipment.

The development of high-efficiency rolling-mill equipment is coming to fruition thanks also to improvements in the organization of production within the association, and to the introduction of new manufacturing processes and machine-tool equipment.

The domestically-manufactured parts for the rolling mills are produced through the implementation of such modern production processes as degassing and electroslag remelting of the steel, controlled temperature pattern forging, electroslag welding, chemico-thermal machining and other processes which provide the parts with high quality and long service life.

New designs are perfected in laboratories and experimental sections. Here also is where prospective materials and production processes are tried out, and in so doing, the foundation is laid for an uninterrupted improvement of production as well as the improvement in the quality of the goods produced.

Press-forging plant equipment ranks high among products exported by the association. As far back as 1960 the USSR put a 7,500 ton-force hydraulic press into operation. The press was developed by specialists of the Novokramatorsk Machine-Building Plant. The original concepts set forth by Soviet scientists and designers in recent years have served as the basis for the creation of a number of heavy-duty presses. So a special-purpose single-cylinder hydraulic press with a force-capacity of 50,000 ton-forces was put into operation in 1976. The press was built in our plant for the USSR Academy of Sciences Institute of High Pressure Physics.

The experience gained in devising these unique machines has made it possible to deliver a huge hydraulic press, the force exerted by which is 65,000 ton-forces, into France to be used for stamping large-sized parts from difficult-to-work alloys and steel. In all, the designing, manufacture and assembly of the equipment for the gigantic press took 3.5 years.

The conclusion of the contract for the delivery of this "machine of the century" (as it was called by the overseas press) to the Interforzh Firm was preceded by an acute competitive struggle with the world's foremost press-building firms. The Soviet machine-building industry carried the day.

High marks have been given overseas to other press-forging machines which bear the NKMZ mark, such as the hot-stamping crank presses, with their 6,300 ton-forces, in India and Italy, in the FRG and in Brazil, Bulgaria and France, the 3,150 ton-force horizontal upset forging machines in India and the steam or air stamping hammers, the drop-hammer of which has a mass of 16 t in India, Italy, the People's Republic of China and Japan.

The constant search for and use of progressive design and technical resolutions allow our specialists to devise press-forging equipment having the very best technical and economic characteristics. The association's designers have designed a number of highly productive presses and power hammers. These include the world's most powerful counterblow hammer, which has an impact force of 150,000 kg/m. It is possible, using this hammer, to stamp parts of ferrous and non-ferrous metals and their alloys, as well as parts made of high-temperature (heat-resistant) materials up to two tons in mass. Six hydraulic presses having impact forces of 5,000, 10,000 and 15,000 ton-forces have been designed, and meet the most up-to-date requirements. The presses with 10,000 and 15,000 ton-forces have already been manufactured and are in operation for customers.

A high-strength steel band has been incorporated into the design for these presses, making them much lighter than similar, traditionally designed presses.



The Novokramatorsk Machine-Building Plant Association has designed and is building a hydraulic press which exerts a force of 16,000 ton-forces and has three broaching systems. This press will make possible the manufacture of parts requiring deep cavities and will insure that the shape of the blank approaches the shape of the finished part as closely as possible.

The association is also constructing a special-purpose hydraulic press which is capable of exerting 30,000 ton-forces, for use in hot-stamping flat parts from granules of high-temperature alloys.

These hot die forging crank presses with their 6,300 ton-forces of pressure and the horizontal upset forging machines which exert 2,000 and 3,150 ton-forces of pressure have been operating reliably for 15 and more years at a number of USSR enterprises. The new crank presses presently being manufactured by the Novokramatorsk Machine-Building Plant have more rigidity (about 1,350 ton-forces/mm), and longer-lasting bearings in the drive and actuating mechanisms.

The forging and pressing equipment manufactured by the association matches, and in some cases surpasses the best foreign models with regard to its technical and economic data.

A great portion of the equipment supplied by the association is made up of blast furnace and steel mill equipment. There are stationary mixers with a capacity of 2,500 t of liquid cast iron which are operating successfully in India, in Hungary, Yugoslavia, Turkey, Egypt, Pakistan, Iran and Finland there is similar equipment with 1,300 t capacity and in Poland, 30 mobile mixers, having 420 t capacities.

There are installations for hard-facing the cones and basins for the charging devices on blast furnaces with the NKMZ trade mark, which are working successfully in Hungary, Yugoslavia and Pakistan.

The rapid growth rates in open-pit mine workings have required the development of continuously-operating equipment not only for stripping, but also for working seams which were frequently quite hard. The specialists were faced with a number of technical difficulties as they worked on designing new types of wheeled excavators. First of all they had to increase the design parameter of the excavation force by more than 2-fold compared to that achieved in world practice. Here, they had to provide the machines' bearing structures with sufficient rigidity. The large wheeled mining complexes which were developed by our association are found nowhere else in the world. These complexes use an original travelling system: a rail-walking mechanism which greatly simplifies the machines' design and makes them easier to service.

Model ESh-6/45M and ESh-10/7A walking excavators, mining hoist equipment with 4-, 5- and 6-m barrel diameters and grinding mills used in wet-grinding ore and nonmetalliferous materials, with rated working volumes of from 35 to 140 cubic meters make up a significant portion of exported shipments.

The model ESh-6/45M and ESh-10/70A walking excavators are used widely in stripping operations in open-pit mining for transport-free systems, as well as in major hydraulic engineering projects.

A study of the operating experience of excavators used in a variety of the mining-geological and climatic conditions of the Soviet Union has made it possible to develop reliable highly-productive machines which can work successfully in a temperature range of from  $-40^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ . Walking excavators are manufactured on special order for work in tropical regions. Walking excavators can be used for excavating soils of from first to fourth grade hardness. They have been shipped to Yugoslavia, the German Democratic Republic, India, Iran, the Mongolian People's Republic, to Cuba and to certain other countries.

In comparison to the models produced by foreign companies, the walking excavators manufactured by the Novokramatorsk Machine-Building Production Association are noted for their increased linear parameters with a comparable weight and bucket capacity. This provides minimal metal use per unit in the excavators' design, and this is also attained by the widespread use of alloyed steels in the mechanisms and basic structural assemblies, and by rational schematic resolutions in the assemblies, which resolutions determine the machine's weight, and finally by the refinement of the machine's production processes, which guarantee stability in the quality of its manufacture.

The excavators are equipped with comfortable cabs for the operators. The cabs provide the operators with an excellent field of view of the mining face and ease of control.

If so desired by the customer, the association provides technical supervision in assembling the excavators. This is carried out by skilled specialists who are sent specifically for this purpose.

When operating in average mining geological conditions, where the operating rules are observed and where the mining operations are carried out in rational fashion, the ESh-6/45M excavator remove on the order of 1.8 million cubic m of rock mass, at 2.8 million cubic m for the ESh-10/70A models. In cases where the operating conditions do not call for the machine to have great linear parameters, the ESh-10/70A excavator is produced in the ESh-13/50 version with a bucket capacity of 13 cubic m and a boom length of 50 m. This machine is capable of excavating 5 million cubic meters of rock mass per year.

In addition to excavator equipment, the association manufactures such exportable mining equipment as heavy-duty hoists with a lifting capacity of from 16 to 50 tons, and which can hoist loads from depths of from 300 to 1,300 m.

Further improvements in mining hoist engines is underway in the direction of increased lifting capacity, automation of control processes and increases in the high-speed response of their braking systems. Special-purpose machines are being designed to mine ore from deep open-pit iron ore mines in skips, the projected lifting capacity here is set at 80 t. The mining hoist engines produced by the association are noted for their high degree of operational reliability and the excellent quality of their manufacture.

The association manufactures ore-crushing mills for wet-crushing ores. The mills have drum diameters of from 3.2 m to 5.5 m and rated working volumes of 160 cubic meters. They are noted for their simple design and the high degree of their operational reliability.

All the standard size mills produced by the association are available for export.

During the 10th Five-Year Plan period the association manufactured about 150,000 t of equipment for export. In the course of the 11th Five-Year Plan period the Novokramatorsk Machine-Building Plant Production Association has delivered rolling mill equipment for export, including equipment used to renovate operating rolling-mills, single-bucket excavators, mills, mining hoist machinery, rolls and a number of types of spare parts.

In recent years the collaboration of NKMZ with the organizations and enterprises of Council of Mutual Economic Assistance member-nations in developing heavy machines has undergone continued development. There has been widespread cooperation in the field of the development, manufacture and shipment of equipment for large-scale rolling-mill complexes. There are many similar examples of such cooperation.

The model 3600 sheet mill, which is the largest in the Polish People's Republic, was built in the integrated iron and steel works in Chénstokhov, and was developed conjointly by Soviet and Polish workers and engineers. The equipment for the main part of the rolling mill was designed and manufactured by NKMZ, and the sheet-finishing equipment--by Polish enterprises. The goods produced by the rolling mill meet the highest requirements.

The model 3600 and 3000 plate mills were built in integrated iron and steel works in Zhdanov, a rolling mill was built in the Krasnyy Oktyabr works in Volgograd and the model 3600 rolling mill, slated for export to India, are all unique rolling mill units constructed by NKMZ together with Czechoslovakian machine-building enterprises.

This close collaboration binds our association with the Erdenet Mining Enrichment Combine, located in the Mongolian People's Republic. NKMZ manufactured over 10,000 t of equipment for the enterprise's start-up complex. It is first a case of ore-crushing mills and walking excavators.

The equipment manufactured in our association is delivered to other member-nations of the Council of Mutual Economic Assistance as well. Cylindrical mining hoist machinery have been acquired by the GDR, the CSSR and Bulgaria, and we have shipped heavy-duty ore-crushing mills to enterprises in Romania and Bulgaria.

We have been aided in the manufacture of mining equipment by enterprises in socialist countries which have delivered certain metalwork assemblies for excavators, mining hoist machinery and ore-crushing mills.

Close bonds have been established, particularly between the workers of Novokramatorsk and those of the People's Republic of Bulgaria. Regular shipments of high-capacity mining, rolling-mill and press-forging equipment are shipped to enterprises in this fraternal country.

In 1955 the Novokramatorsk workers built a rolling mill for the pioneers of Bulgarian metallurgy: the imeni V. I. Lenin plant. At a large integrated iron and steel works in Kremikovttsy in 1968 a semi-continuous model 1700 strip mill was put into operation, and following renovation, its productivity increased and the quality of its rolled metal stock was improved. The association has manufactured walking excavators, crank hot-stamping presses with capacities of 4,000 and 6,300 ton-forces and ore-grinding mills for Bulgaria. The construction, in Sofia in 1971, of a model 850 X 1500 rolling mill for the hot rolling of non-ferrous metals and complex alloys was quite important to the development of Bulgarian non-ferrous metallurgy. As a result of the successful and high-quality installation of this rolling-mill, which surpassed its projected level of productivity, a group of specialists from the Novokramatorsk Machine-Building Plant were awarded Bulgarian decorations.

In the period from just 1966 to 1983, NKMZ sent about 46,000 t of various equipment to Bulgaria and sent over thousands of batches of technical documents, including specifications for mining hoist machinery, ore-crushing mills as well as documents concerning the electroslog welding of oversized parts for rolling-mill and forging and pressing equipment.

In Radomir at present, the Soviet Union is assisting in the construction of heavy-machine-building plant in the Balkans, and here the Novokramatorsk workers are rendering a great deal of help. The new production method, introduced at NKMZ, is being successfully implemented in Radomir. Also, training of the skilled Bulgarian work force of machine-builders is under way in the Novokramatorsk Machine-Building Plant Production Association. The engineering and technical personnel of the future plant in Radomir were trained in association shops and departments. Dozens of Bulgarian specialists acquired skills as milling machine operators, crane operators, electricians, steel workers on open-hearth furnaces, forge hands, pattern makers, arc welders, gear-cutters, pyrometrists, and forging hammer operators. Bulgarian engineers studied a number of different technical problems, production planning and organization, and familiarized themselves with innovations in production, new production processes and the equipment which was first introduced in our plant.

The collaboration and cooperation of the Novokramatorsk Machine-Building Plant Production Association with the enterprises of fraternal socialist countries in the development of equipment promotes their mutual enrichment through work experience, helps to raise the technical level of the industry and is a solid contribution from the machine builders of the fraternal nations to the acceleration of technical progress and to the business of consolidating the industrial might of this same socialist fellowship.

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## CONSTRUCTION MACHINERY AND EQUIPMENT

### INNOVATIVE BUILDING CONSTRUCTION METHODS IN FAR NORTH VIEWED

Moscow SOVETSKAYA ROSSIYA in Russian 6 Feb 85 p 3

[Article by M. Krushinskiy and A. Shchegolev, SOVETSKAYA ROSSIYA special correspondents, Moscow - Krasnoyarsk - Magadan: "The City of the North: Today and Tomorrow: To Develop Means to Make Inhabitable"]

[Text] Last summer we were invited to a meeting of the urban development council, where a project for a new residential region was discussed -- essentially a city for 100,000 people. Oganer, the name of the locality selected for the construction site, is what the future complex will be called; it is a name that has long been on the lips of the people of Norilsk. One can hear it even outside the Yenisey North, for Oganer is an attempt to bring to life a conception of great complexity: the creation of a large residential complex that will be the model polar city. The best achievements of northern architecture, design, engineering ideas and industrial house-building will be incorporated in it. One of the initiators of the unique planning and construction firm which brings together architects of Norilsk and Moscow, board chairman for the RFSFR Architects' Union A. G. Rochegov, said:

"The satisfactory realization of the Oganer project is important as a matter of principle for the whole North of Russia. This construction project is to become an example of the urban development of uninhabited territories."

Why do we speak more and more persistently about the North not only as a gigantic store of fuel energy and raw material resources, but also as the front line of civil residential construction? Because urban development and the society's productive forces are indissolubly connected. The creation of the best conditions for everyday life and work in regions with severe climates that are difficult to reach leads to a rapid development of productive forces.

"And still, without laboring under the slightest delusion, we must clearly recognize that our achievements are only separate successful strokes. Such successes are for the time being many times fewer than the defeats," reflects first deputy chairman of the RFSFR Gosstroy [State Committee for Construction Affairs] Nariman Valentinovich Sukhanov, with whom we met at the third regional meeting of northern architects which recently took place in Magadan. "Much of what we plan, design and build in the North still does not fully conform to local conditions and the northerner's daily life requirements. The fact is

that there is still no unified technical policy of urban development and capital construction in the North."

Therefore a comprehensive scientific and technical urban development program, "North-2005," has now been developed; this will become a component part of the Comprehensive Program for Scientific and Technical Progress in the USSR.

"Room Wanted...", "Young Family Needs Apartment...", "Wanted to Buy -- Mobile Home..." Unfortunately such announcements are no rarity in all northern cities and settlements. With the national lack of workers, the shortage of living space considerably complicates the development of northern territories. Our newspaper already wrote about the almost unavoidable appearance in new cities of temporary panelboard living structures alongside buildings several stories high, as well as other problems of northern urban development. However little has changed since then.

We know -- this is corroborated by practice and the analysis of specialists -- that man does not live in the North by coefficient alone. He leaves most often not because the climate is unsuitable or the pay is low, but because of difficulties in housing and in putting his child in kindergarten. There are few institutions of higher education, facilities for relaxation or cultural centers... The Oganer project, personifying the cooperation between local and Moscow architects, is made for a specific region taking into consideration its climatic peculiarities, including swallows that do not yet mean spring is here. Much more often, as one can notice throughout all the cities and settlements of the North without exception, you see buildings on the streets strikingly similar to those found in cities of temperate latitudes. At the same time there are in existence more than 50 special types of designs for residential block sections and 115 model designs for public buildings. Variations for all tastes and situations? We will not hurry with our conclusions. The adoption of one or another building construction system does not yet have a sufficiently sound foundation.

Construction in the North is not cheap. In Magadan Oblast, for example, a square meter of living space costs the state on the average three times what it costs in the European region. If we consider the remote areas of Chukotka, this figure grows even more. We hardly have to explain how important it is here to "measure seven times," to carefully weigh all factors, before beginning construction of a project and launching the production of a new construction series. If one permits inaccuracy in a project and "saves" on exploratory work, years will be taken up with correcting errors and millions of rubles will turn out to be lost on nothing.

The people of Magadan discovered this sad news in constructing large-panel residential buildings of the 122 series. On the exterior they are even elegant. However the interiors of the buildings are freezing at the seams. Of course, if additional measures are not adopted for heating, it costs the state no small sum of money. In spite of the shortage of living space, it happens that new settlers do not rush to get an apartment authorization: it would be better, they think, to be patient for awhile, to wait until something warmer and more dependable is thought of.



"The price is very high for decisions made in urban development," notes Ye. M. Vinogradov, first deputy chairman of the Magadan oblispolkom [oblast soviet executive committee]; "correcting slips that have been made is very difficult."

Of course he has in mind not only and not so much the unsuccessful series of residential buildings developed, by the way, by Leningrad specialists. The matter involves a broader range of questions.

"Almost five years ago the Dukat mine started working. And there wasn't enough living space. Although there was a section on nonproduction construction in the design for the complex, the residential settlement was still in its initial phase. And it is considered that there was no legal violation of any kind. By mutual consent between the Severovostokzoloto Association and USSR Mintsvetmet [Ministry of Nonferrous Metallurgy], construction proceeded under two title lists: production and nonproduction construction. They said it was more convenient. To get production capacities into operation on time, the construction managers could direct capital and resources from the 'residential' section to the 'production' section..."

There are also examples of genuinely economical, thriftily calculated strategies proceeding out of the unity of interests of the state and each separate person. Who has not had occasion to hear about the settlement with the poetic name of Sinegorye? The builders of the famous Kolymskaya GES [Hydroelectric Power Station], already partly built and producing power, live in it. But not everyone, perhaps, knows that the well-equipped housing complex was built here before the main thrust of basic work on the dam site was developed.

Many BAM [Baykal-Amur Railway] projects can serve as models for a comprehensive approach to urban development tasks conforming to plan. There are good examples in Murmansk and Tyumen oblasts. And still there are far fewer of such models to be imitated than one would like. One of the reasons is the excessive number of organizations carrying out building projects.

And each of them is inclined to take a narrow, parochial view of the common cause, to calculate only its own finances. In Magadan Oblast alone, 86 subdivisions of 26 ministries and departments are occupied with construction and reconstruction. What do the northern urban developers think about this? Employment by a single customer is necessary. If this exists, the artificial barriers on the road to comprehensive construction disappear. Who should take this role on themselves? We think the local Soviets.

"Unintegrated, 'bit-by-bit' construction very much complicates life for us builders, too," says V. G. Mikhaylov, Magadanselstroy manager. "Before starting directly to fulfil the order, we ought to 'get into' the settlement and create a supporting section base: a mechanized cement depot, a warm equipment site and a dormitory for the builders. It is likewise imperative to make determinations about transport: how to haul the materials and equipment. No less than two years needs to be spent on this. Is such careful preparation justified? Yes, if a sizable volume of work lies ahead. However, as a rule,



it doesn't always..."

Mikhaylov cites the example of Uelen, the most northeastern settlement in the country. A dependable sea berth should be constructed, and then the broadly integrated building should be developed.

"Instead of that they say: for now let's build only the school. Transport? Unload the vessels in the roadstead. But that's the Arctic Ocean there, with its fog and storms. This summer a motor vessel loaded with panels stood in the roadstead off Cape Dezhnev for two months and was unable to unload.

"Measure seven times..." Nowhere does this saying sound quite so to the point, probably, as in the North.

In five areas of the Chukotskiy Autonomous Okrug a successful advance of large-panel residential buildings of the "Arktika" type is being developed. They are not very elegant to look at. However the three-layer walls (like generous sandwiches) are not afraid of the cold and blizzards. There is one more important merit in these buildings: their technological feasibility.

Has the standard finally been found? Unfortunately, no. One of the essential peculiarities of the North is that it is very diverse and resembles nothing else. And not only because everything is on such an enormous scale. Two neighboring regions may have basic differences. For example, "Arktika" buildings are not used in regions with high seismic activity, which sharply narrows their use. Moreover, this project, born in Chukotka and developed in the Moscow Industroyproyekt Institute, in a certain sense has not been carried to its logical conclusion. How good it would be to erect schools, hospitals and clubs based on it -- in a word, all that is included in the concept of "social infrastructure"! However we don't have this -- only residential buildings. And at that only "buildings of a hotel type." It seems in each case we need a separate construction facility for housing and another for all the rest. The tendency for things to become more expensive is obviously being kept in view. It is true that quite recently hopeful news arrived: a project for a kindergarten based on "Arktika" construction has been created. Will it pass the practical test of the severe North? The near future will tell.

Dealing with the North requires that many familiar stereotypes be re-examined. It is usually thought, for example, that large construction industry facilities are always more economical than small ones. What reason is there, as a matter of fact, to split production up? None, if we are talking about heavily populated areas rich in transportation arterials. But what if the population points are many hundreds of kilometers away from each other and there are neither railroads nor highways between them? Before the introduction of "Arktika" construction, Anadyr was being built all the way from Vladivostok -- the necessary materials were hauled over thousands of nautical miles.

And now in the settlement of Talon, in the Olskiy Rayon of Magadan Oblast, they have decided to create their own facility for large-panel house building. It is not very big, only 10 thousand cubic meters a year, and has an exclusively "local" purpose: the integrated building of the central farm center for the

Tauyskiy Sovkhoz. At first glance it is not reasonable. But in fact everything is calculated to reduce the hauling of materials to two-fifteenths its previous level. Where there are no roads, the erection of local construction industry facilities brings the cost of building down. This is one more example of the incompatibility of the concepts of tight-fistedness and economy.

Why has the "Arktika" series, which we just mentioned, not yet been widely developed for use? One of the most distinctive reasons for this is the lack of correspondence between normative documents (SNIP -- construction norms and rules) for various urban development situations in northern regions. It is improbable, but a fact, that in the Polar Zone construction is carried out using the same norms and rules as in the central belt of Russia. We believe we are not mistaken in saying that the main dream of northern urban developers is the creation of more up-to-date norms and rules not only for the region as a whole, but for each of its climatic zones. Many proposals to this effect have piled up at RSFSR Gosstroy. It is time, high time, to give them an outlet in construction practise. There is not even a unified point of view in determining the boundaries within the northern zone of the country; at least three independent variations exist. You would not envy the designers if the construction site turned out to be somewhere in between these different interpretations! Adjustment of construction norms and rules will give not only a technical advantage and obvious economic benefits, but also social conveniences.

However, why are we talking only about the city? Even outside the workers' settlements in the North there are many other kinds of settlements, where, since recent times or from time immemorial, people have been producing milk and meat, fur-trapping, catching fish, hunting wild game and grazing reindeer. How does the future northern village look?

Together with the city developers that got together at the meeting, let's go to the settlement of Klepka in the Ol'skiy Rayon where one of the oblast's model agricultural enterprises is located: the Ol'skiy Sovkhoz. The people of Magadan are right in being proud of the integrated construction of this farm. The school, Palace of Culture, Domestic Services Building, stores, children's and health care institutions -- all, in every detail, are city buildings with all the conveniences, and a swimming pool is in the planning. Naturally there is no personnel turnover; those who want to have work here must get on the list.

But at the moment, out of the 1,500 inhabitants of Klepka, there is not a single person who owns his own cow. Where would you keep her? Surely not on the balcony of a five-story building. The designers agree: the farm settlement, as it was seen by its planners some 15 years ago, did not turn out. The experiment stopped half-way. The foundations for the first five models of two-apartment buildings with all the out-buildings are being laid only now.

Recently in Dudinka we got into a conversation with secretary of the Taymyrskiy Okrug party committee I. S. Savchenko:

"Imagine how long we have been looking for a suitable design for the Yenisey country, but we can't find one. There are no integrated projects that take into consideration the traditions of the peoples of the North and their contemporary social and cultural needs. And we so need a modern, convenient northern settlement!"

The settlements of reindeer breeders, hunters and fishermen are especially in need of the architects' help. Their secret desire is to obtain projects of mobile, well-equipped housing; the very technology of keeping a herd of reindeer, for example, requires a nomadic life style. And it is not thousands but tens of thousands of people who are occupied with this difficult business in the North. Today they are protected from the rain and wind, the snow and cold in shelters patterned on the traditions of their ancestors. It is true, they incorporate the wisdom of the ages, accumulated by man in his struggle with nature. But isn't it time to bring the knowledge of our time to this place? All the more so since there are many sound organizations that deal with the construction of mobile housing, compact survival units, highly mobile means of transport for serving reindeer breeding teams and hunting and fishing artels. Among them are LenZNIIEP, Soyuzsportproyekt, KievZNIIEP and others. There are even experimental models in existence. But there are not enough people wanting to take on series production. The plants that manufacture them excuse themselves from the extra bother with truths and untruths.

So what are the prospects? We took this question to architect A. I. Shipkov, now an employee of RSFSR Gosstroy. The choice of people for this conversation was not accidental. Before us was the prototype of the main hero from the film by the famous Soviet director S. A. Gerasimov, "To Love a Man." Belonging to him are the still seemingly fantastic designs for northern cities with buildings united by winter gardens, pyramid buildings and even spherical buildings.

"There is nothing fantastic here. Thinking of the city of the future, we proceed first and foremost from a consideration of usefulness and not of form, as some think. Today's cities for the most part use their energy to heat... the skies. I propose using this heat for the creation of greenhouses, rest areas and passages protected from the cold. Unfortunately, not one of the projects has yet been successfully launched into experimental construction. They have always found reasons: not enough resources, the priority of a massive construction project... Better, they say, a bird in the hand than two in the bush."

He outstripped time, looked into the future, but spent his days in the dimensions of reality. If only one of the projects were successfully executed, we would maybe be operating with other categories today. Department manager for construction and architectural affairs of the Krasnoyarskiy Kray ispolkom [soviet executive committee] V. K. Shadrin spoke to us about almost the same thing:

"Spirited discussions have been going on for decades about how to build in the North. But the bravest and most promising projects so far have not materialized. Experience shows that the absence of experiment is one of the

factors that slows down northern urban development. The Gosplan [State Planning Committee], we are convinced, should commission scientific research institutes, design institutes and construction organizations under the jurisdiction of ministries and departments to verify in practise the hosts of scientific and theoretical premises and plans."

And still, how does the northern city of the future look? Another architect joined our conversation.

"I don't know about the 21st century, but we have already begun creating the city of the future," says Magadan specialist Yu. Kh. Agliulin. "The construction of the Anadyr complex is projected in the form of a sunflower, constantly turned to the sun, with streets protected from the wind as well as entrances to a number of rest spots in the mountains. Passage-way galleries between buildings are also envisaged. But it was a special case with these: in spite of the plan, the builders decided to use the gallery for engineering communications, then changed their minds and now intend to locate auxiliary facilities there. To change the designer's idea so much is the same as hitching a wagon to a rocket engine."

Unfortunately there are many similar examples. Let's recall the famous micro-city on the Udachnaya diamond-mining ["trubka"] in Yakutia. A system of closed gallery-streets linking a group of residential and public buildings became a basic element in the plan for a residential complex for 8 thousand inhabitants. Establishments for shopping and domestic services, which, according to the project designer's thought, were to create additional conveniences for people going home or to work, were set up in the galleries. But local "initiative" changed it all. The builders subdivided the gallery with partitions. The through traffic disappeared and with it all the advantages incorporated in the project.

"And still I believe in a sound future for urban development in the North. In cities that will become not just a collection of buildings and streets but a unified architectural and engineering ensemble set up to serve humans," Shipkov smiled. "If not I, then my grandson will succeed in building them."

Yes, today a system has been created for transforming the region of the North for the next 20 years through urban development. One of its main goals is to work out a single technical policy for all regions. It is now time for its practical realization. The time for an integrated development of the North, the time of daring projects and courageous decisions, that is our time.

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CONSTRUCTION MACHINERY AND EQUIPMENT

SCIENTISTS COMMISSIONED TO DEVELOP DESIGN GUIDELINES

Moscow SOVETSKAYA ROSSIYA in Russian 22 May 85 p 3

[Article by L. Vavakin, deputy chairman of Gosgrazhdanstroy [State Committee for Civil Construction and Architecture]: "In the State Committee"]

[Text] Together with RSFSR Gosstroy [State Committee for Construction Affairs], Gosgrazhdanstroy has examined the article: "The City of the North: Today and Tomorrow" (SOVETSKAYA ROSSIYA, 6 Feb 1985). The problems of urban and civil housing construction for the northern region of the country, which were raised by the newspaper, are important and timely. Their resolution requires harmony of direction of all units in the designing, planning and organization of construction in the North. Gosgrazhdanstroy and Gosstroy of the RSFSR have developed an integrated scientific and technical program for urban and civil housing construction in the northern regions of the country. Its goal is not only to work out directions of technical policy for urban development, but to render practical aid to all organizations, enterprises, ministries and departments engaged in developing the region of the North in the selection of optimum designs and the most efficient methods for organizing construction and a dependable realization of the projects.

The erection of model and experimental construction designs is slated for the near future. The most important activity in the program is the All-Union Competition for Developing Projects for Residential Buildings for Regions of Siberia and the Far North, announced for 1985-1986. The results of the experimental construction and the competition will aid in substantiating and putting into operation new, updated norms and rules for construction in the northern region. A special working group has been created in Gosgrazhdanstroy to prepare suggestions for developing these.

The LenZNIIEP and SibZNIIEP institutes have been assigned the task of radically improving scientific and design work on problems of northern civil construction. In order to provide in the shortest time possible all the climatic sub-regions of the North with model construction designs that take into maximum consideration the local characteristics and realistic prospects of developing a local facility for construction, the practise of attracting local design organizations to submit design models is being expanded.